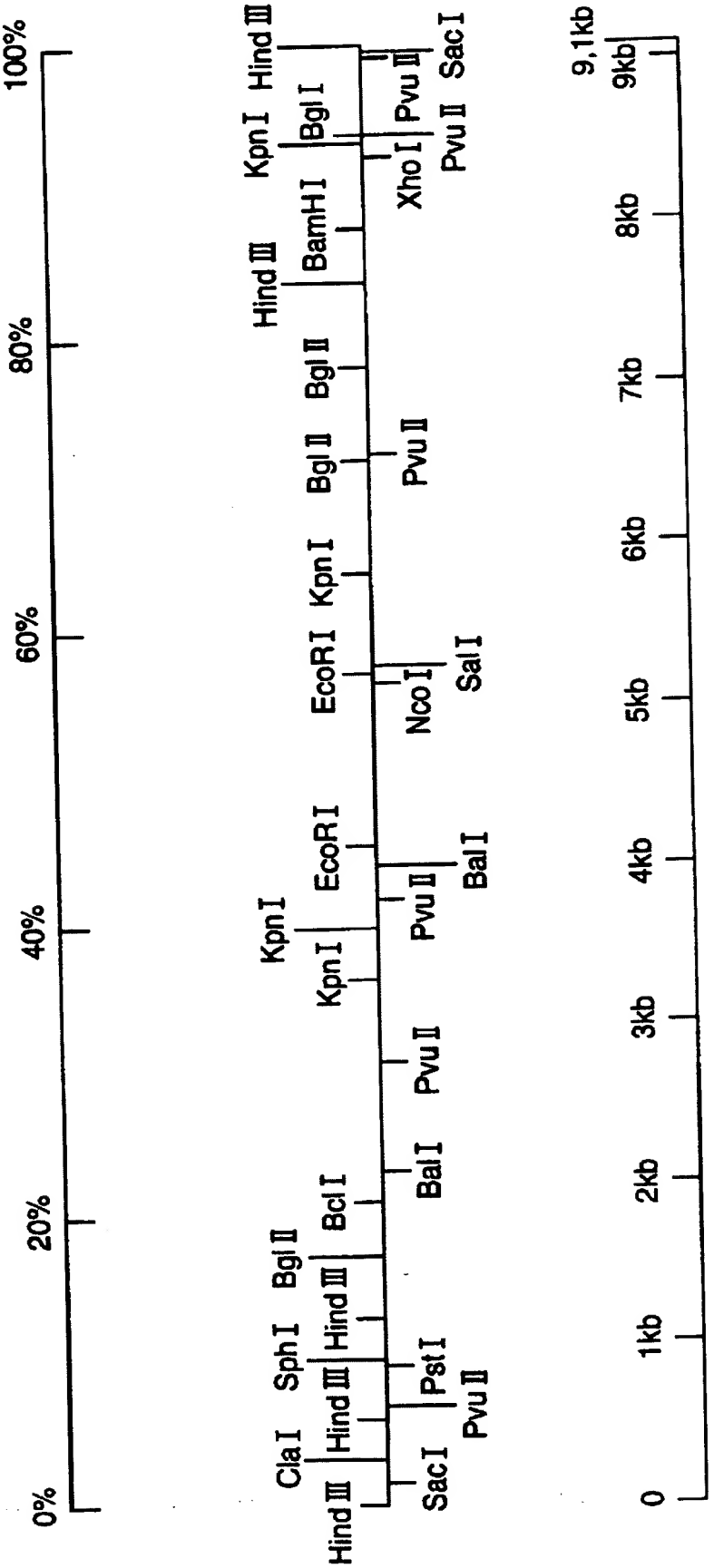
FIG. 1



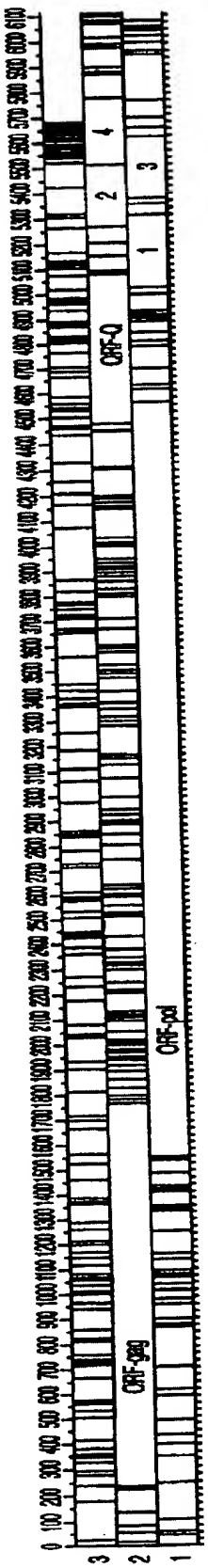


FIG. 2

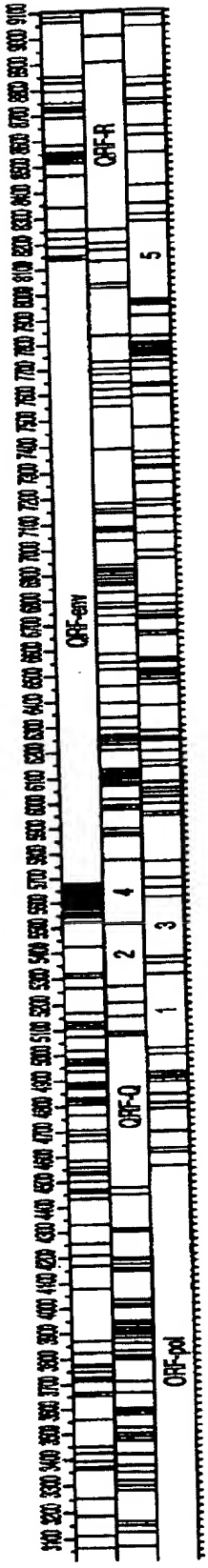


FIG. 3

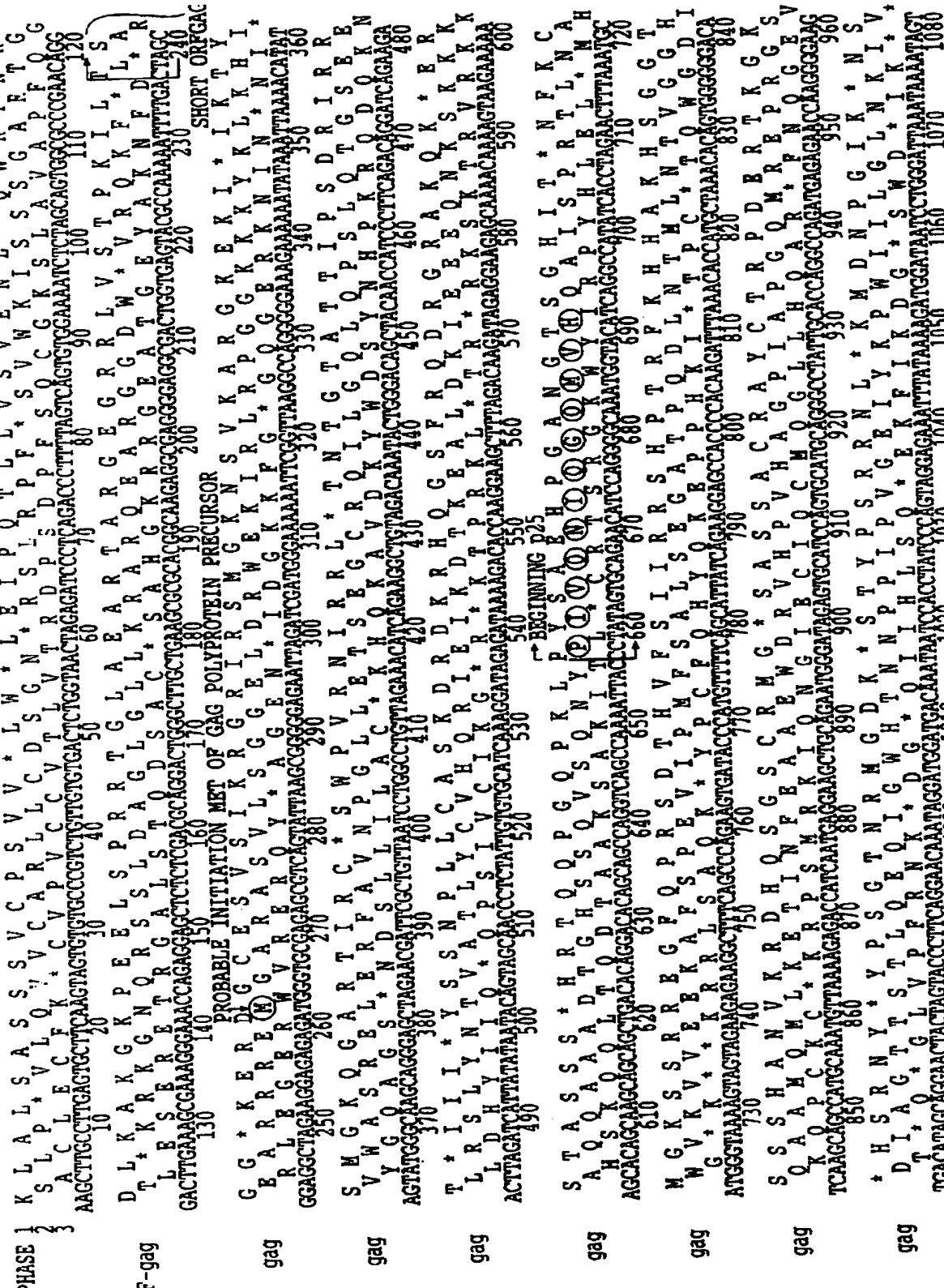


FIG. 4

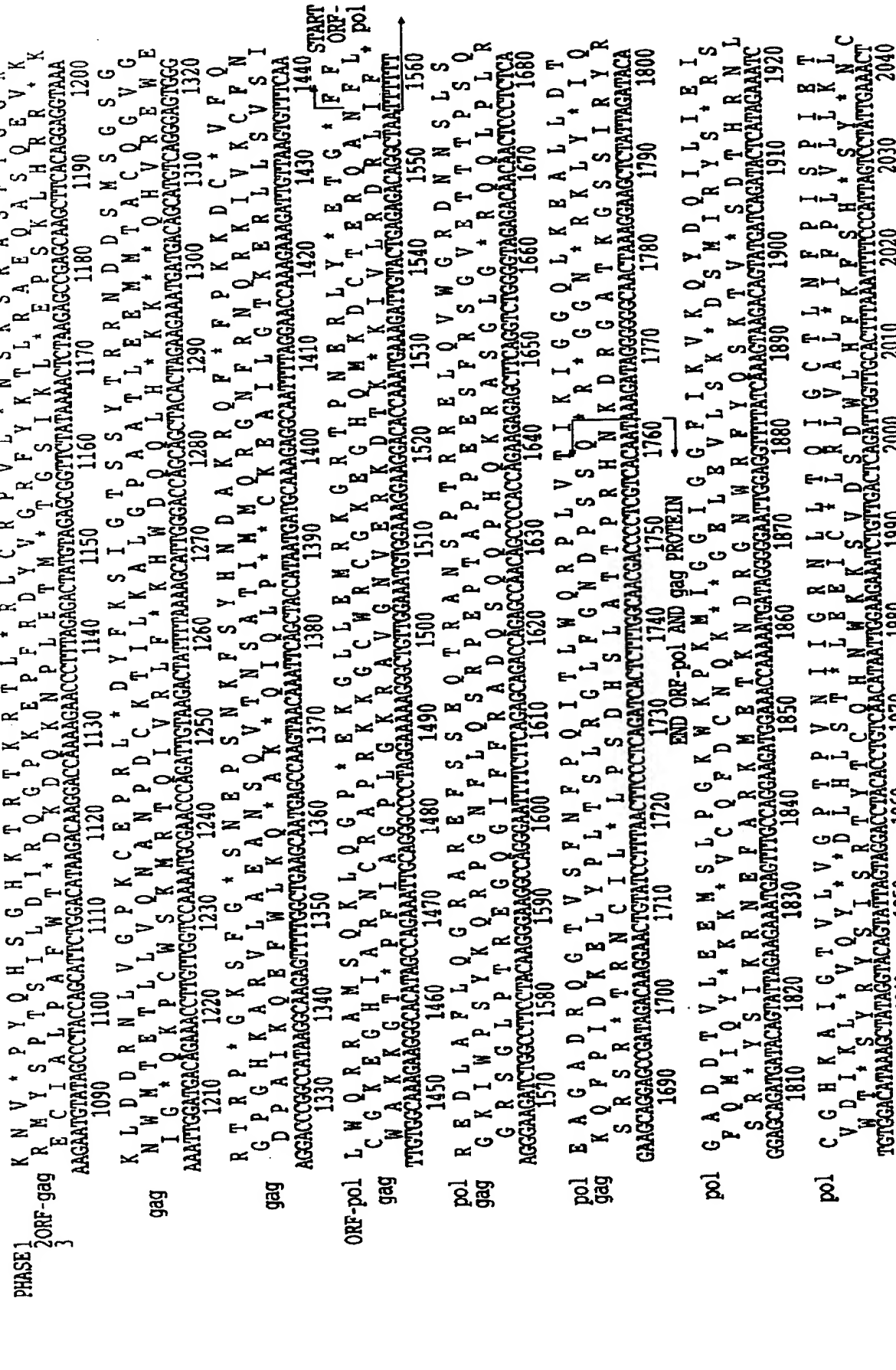


FIG. 5

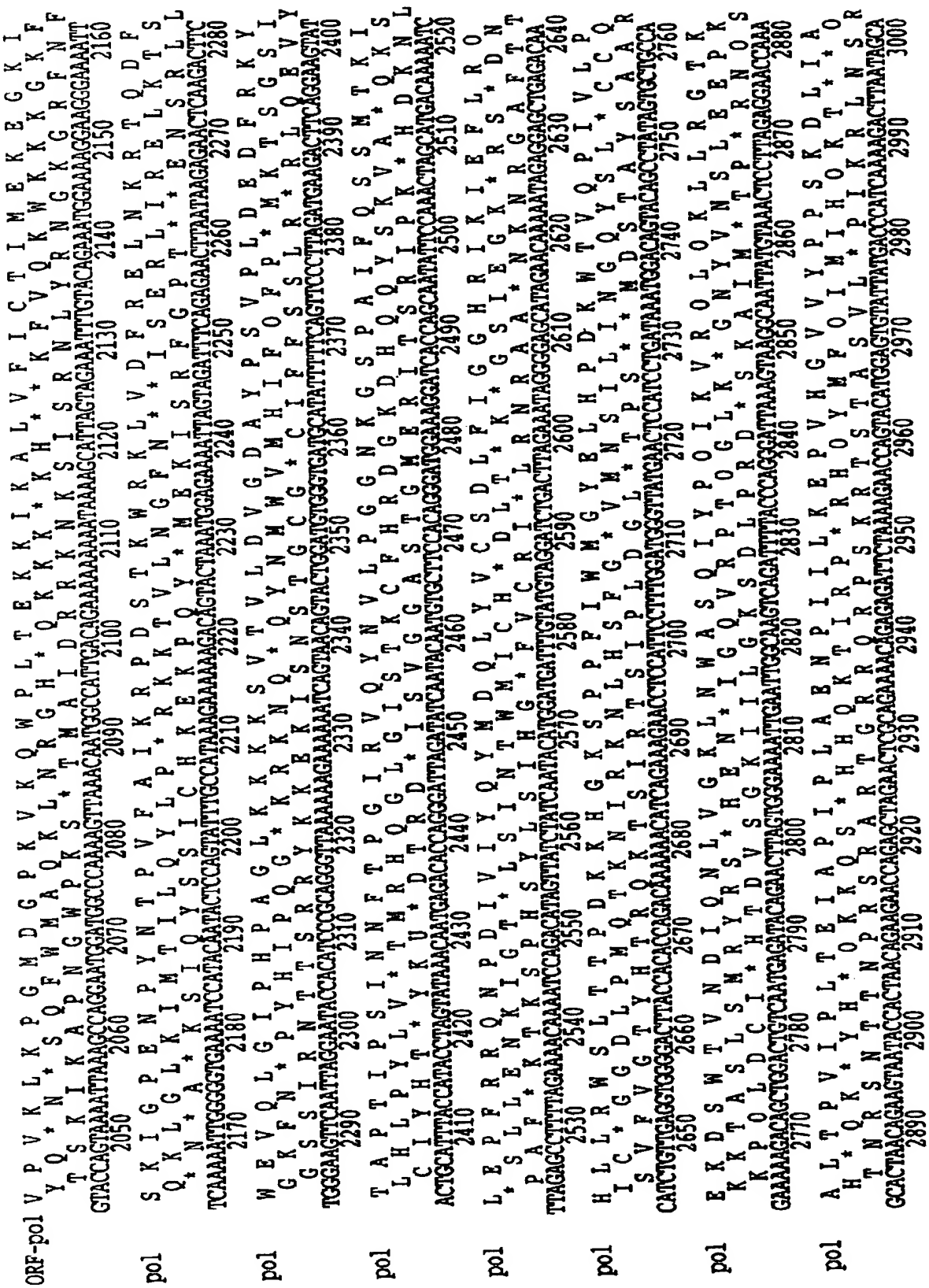


FIG. 6

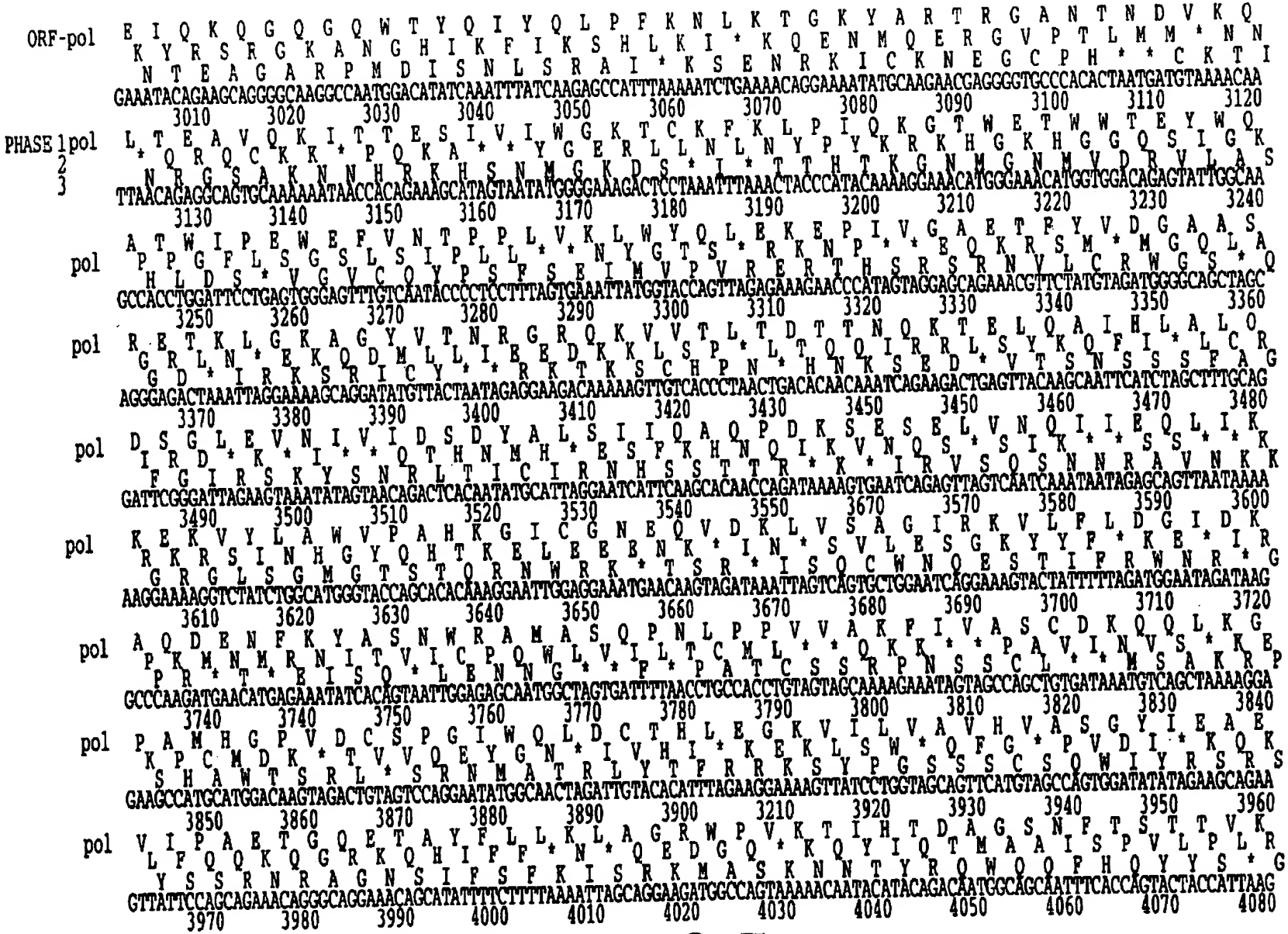


FIG. 7

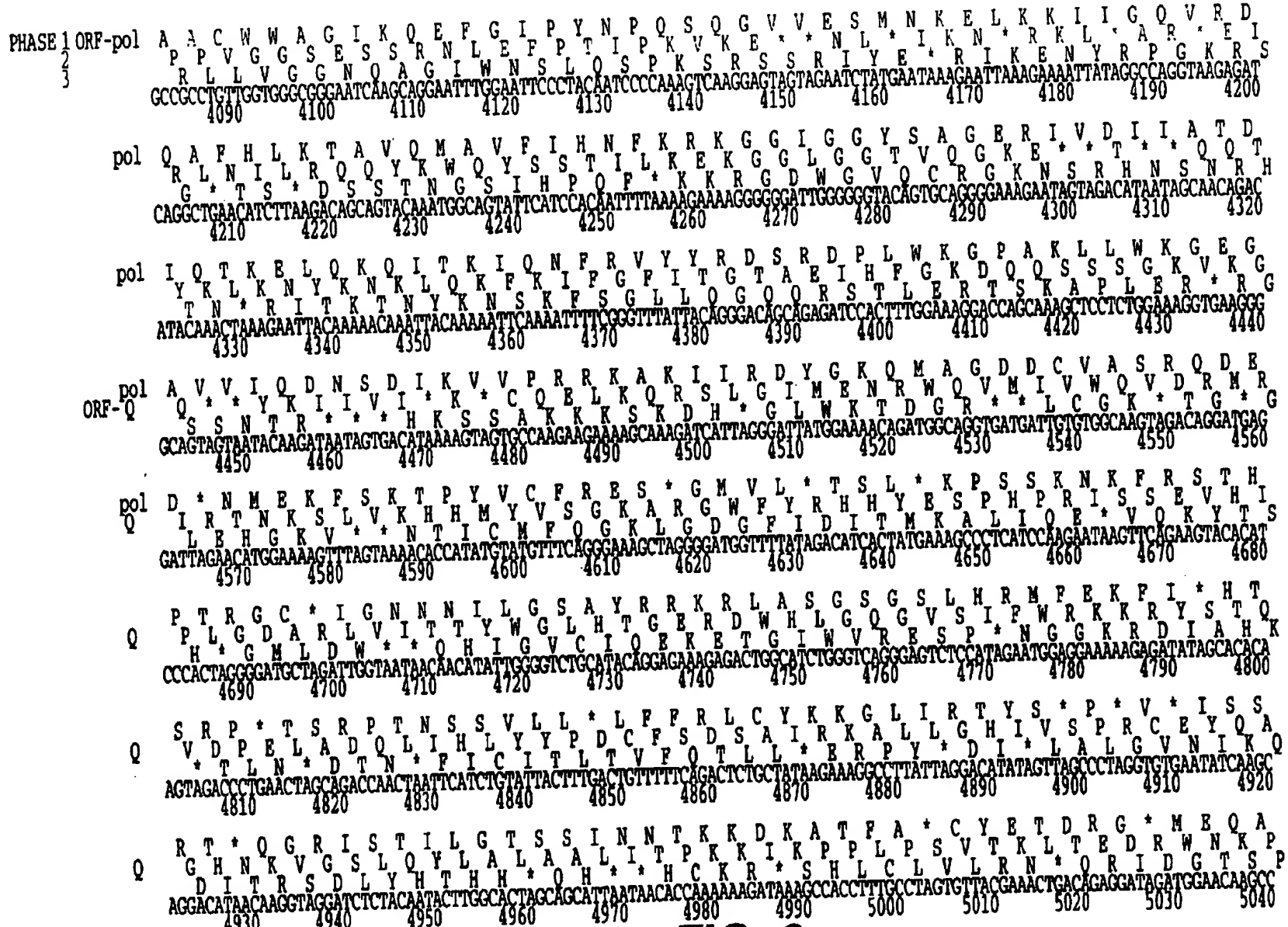


FIG. 8

Replacement Sheet

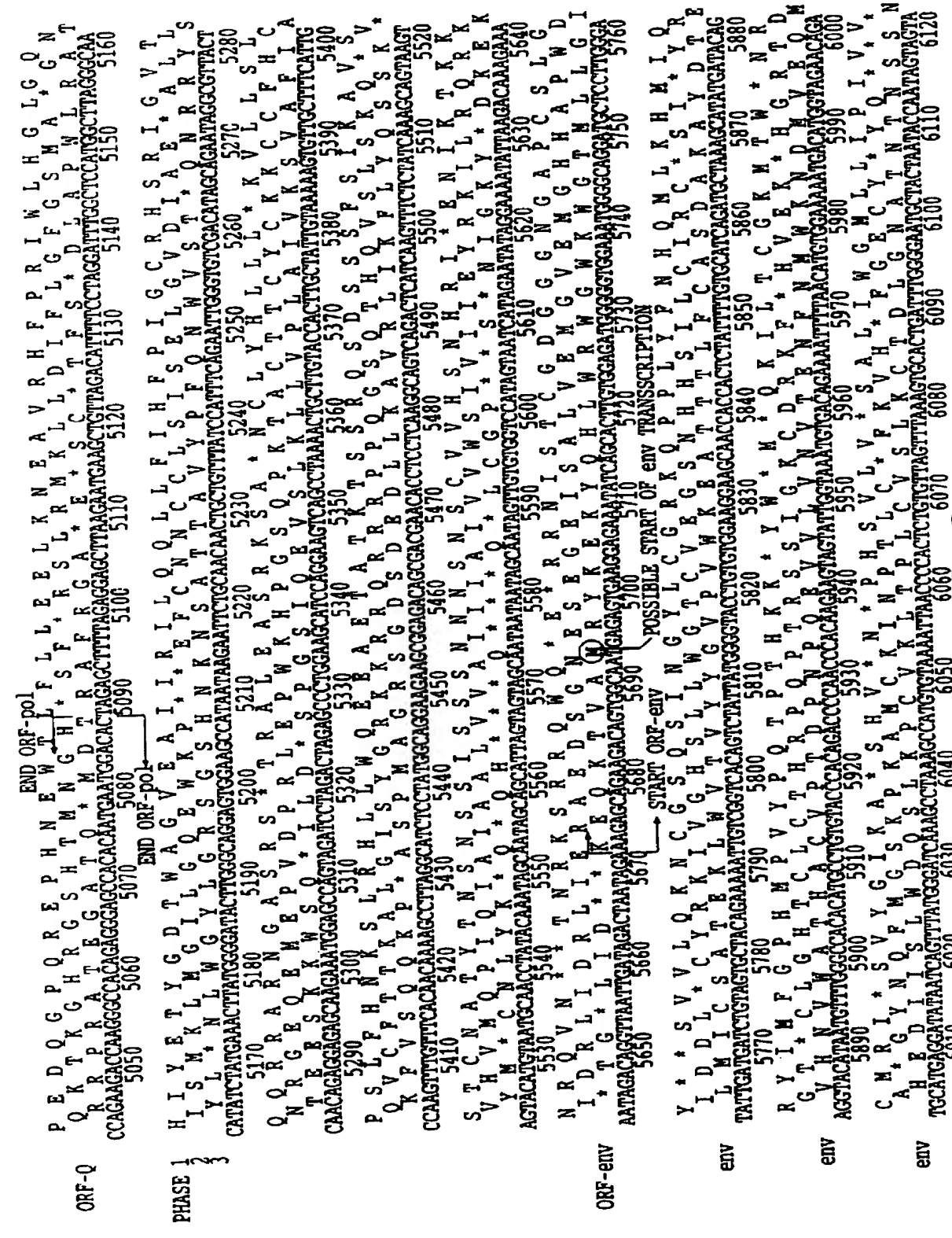


FIG. 9

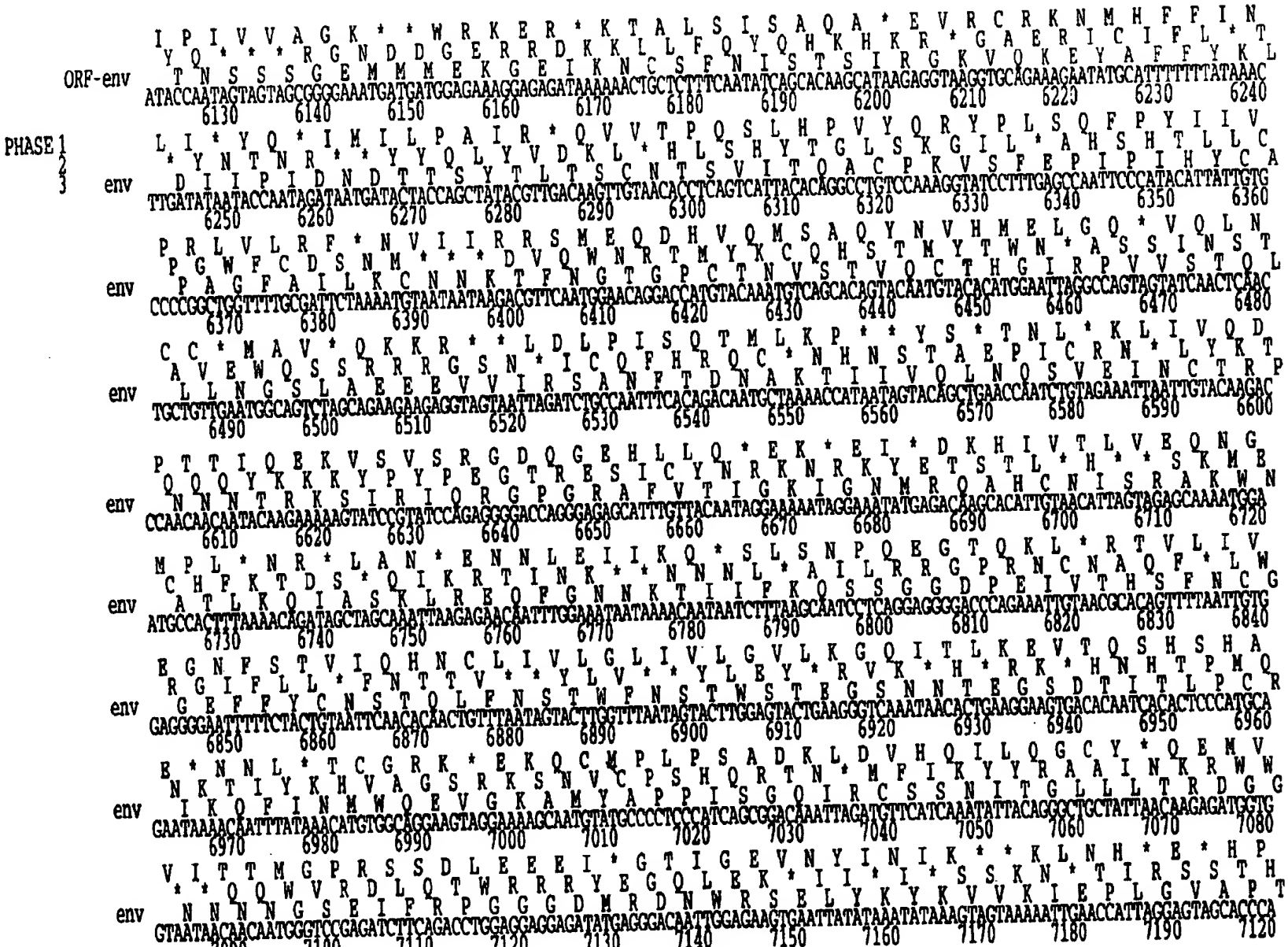


FIG. 10

Replacement Sheet

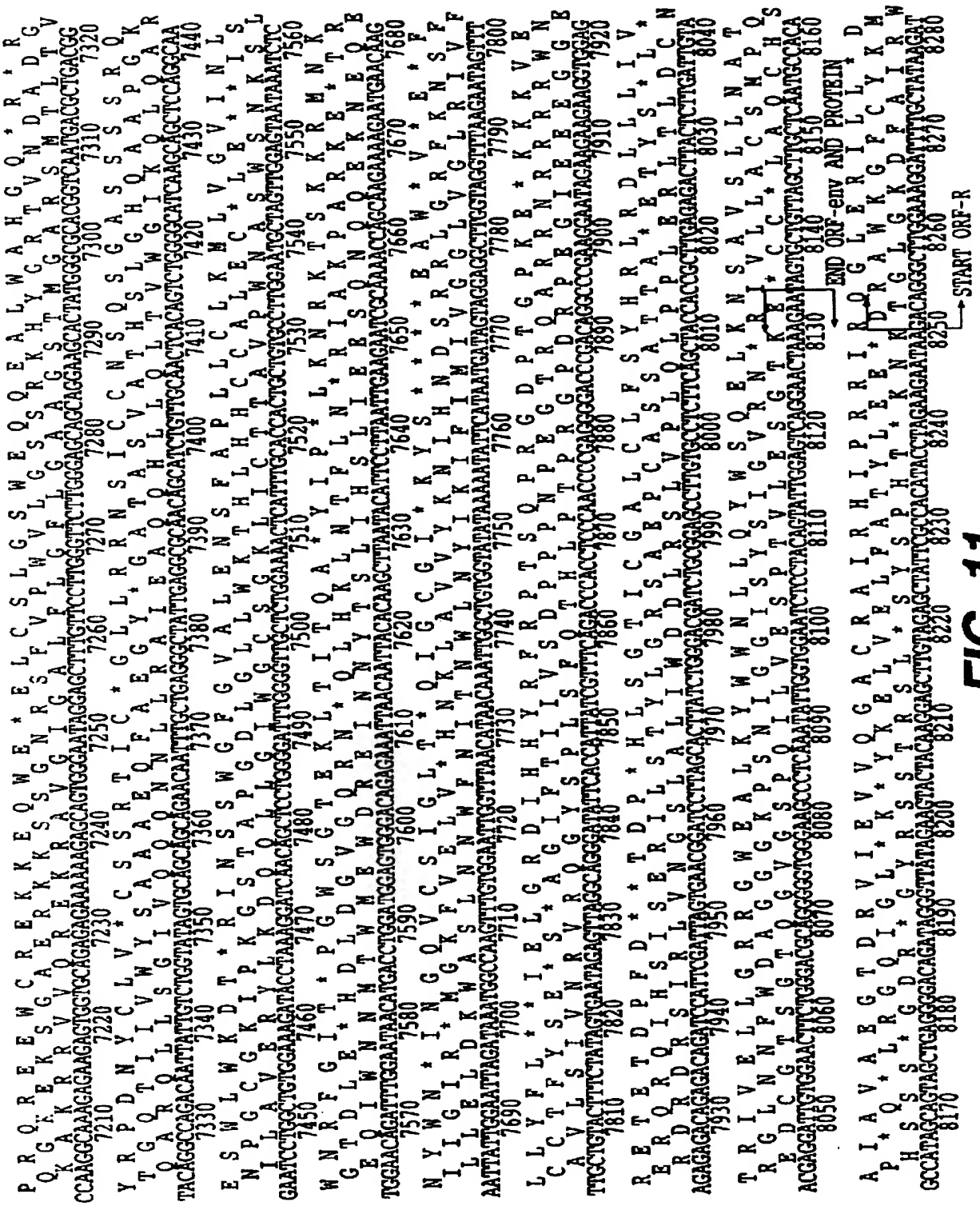
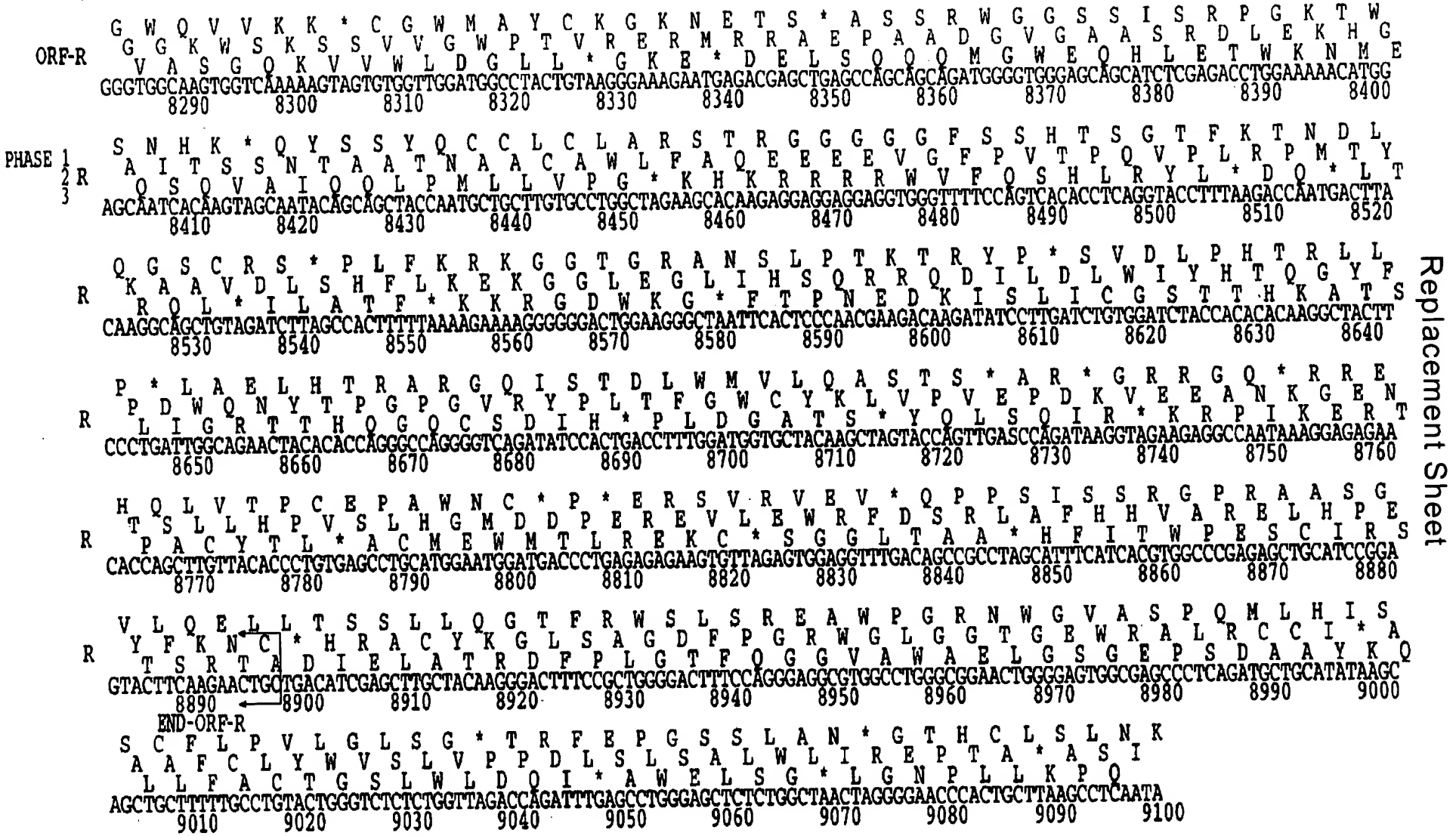

ORF-env
PHASE 1
2
3 env
env
env
env
env
env
env
ORF-R
END ORF-env AND PROTEIN
START ORF-R

FIG. 11



Replacement Sheet

FIG. 12

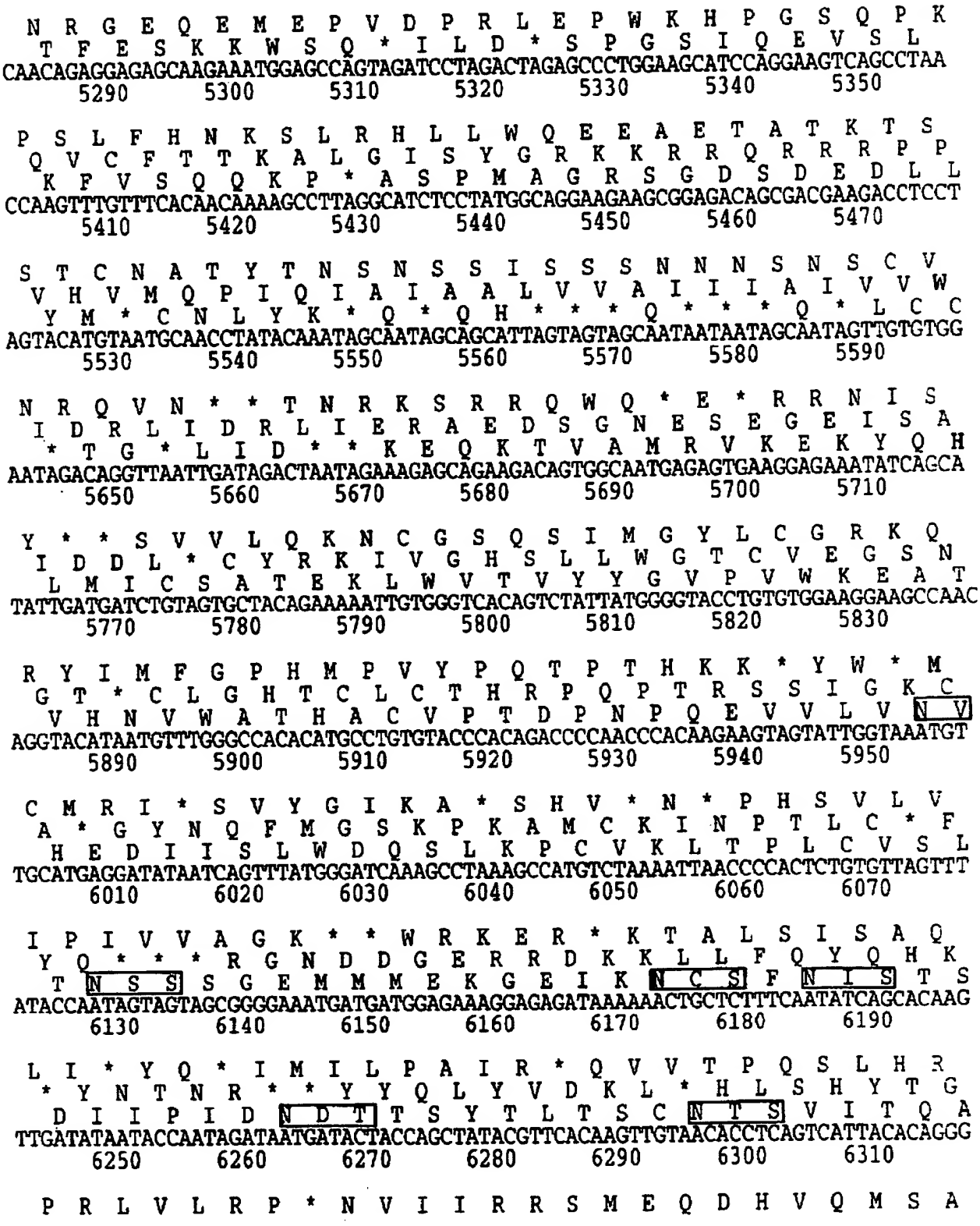

N R G E Q E M E P V D P R L E P W K H P G S Q P K
T F E S K K W S Q * I L D * S P G S I Q E V S L
CAACAGAGGAGAGCAAGAAATGGAGCCAGTAGATCCTAGACTAGAGCCCTGGAAGCATCCAGGAAGTCAGCCTAA
5290 5300 5310 5320 5330 5340 5350
P S L F H N K S L R H L L W Q E E A E T A T K T S
Q V C F T T K A L G I S Y G R K K R R Q R R R P P
K F V S Q Q K P * A S P M A G R S G D S D E D L L
CCAAGTTTGTTTCACAACAAAAGCCTTAGGCATCTCCTATGGCAGGAAGAAGCGGAGACAGCGACGAAGACCTCCT
5410 5420 5430 5440 5450 5460 5470
S T C N A T Y T N S N S S I S S S N N N S N S C V
V H V M Q P I Q I A I A A L V V A I I I A I V V W
Y M * C N L Y K * Q * Q H * * * Q * * * Q * L C C
AGTACATGTAATGCAACCTATACAAATAGCAATAGCAGCATTAGTAGTAGCAATAATAATAGCAATAGTTGTGTGG
5530 5540 5550 5560 5570 5580 5590
N R Q V N * * T N R K S R R Q W Q * E * R R N I S
I D R L I D R L I E R A E D S G N E S E G E I S A
* T G * L I D * * K E Q K T V A M R V K E K Y Q H
AATAGACAGGTTAATTGATAGACTAATAGAAAGAGCAGAAGACAGTGGCAATGAGAGTGAAGGAGAAATATCAGCA
5650 5660 5670 5680 5690 5700 5710
Y * * S V V L Q K N C G S Q S I M G Y L C G R K Q
I D D L * C Y R K I V G H S L L W G T C V E G S N
L M I C S A T E K L W V T V Y Y G V P V W K E A T
TATTGATGATCTGTAGTGCTACAGAAAAATTGTGGGTCACAGTCTATTATGGGGTACCTGTGTGGAAGGAAGCCAAC
5770 5780 5790 5800 5810 5820 5830
R Y I M F G P H M P V Y P Q T P T H K K * Y W * M
G T * C L G H T C L C T H R P Q P T R S S I G K C
V H N V W A T H A C V P T D P N P Q E V V L V N V
AGGTACATAATGTTTGGGCCACACATGCCTGTGTACCCACAGACCCCAACCCACAAGAAGTAGTATTGGTAAATGT
5890 5900 5910 5920 5930 5940 5950
C M R I * S V Y G I K A * S H V * N * P H S V L V
A * G Y N Q F M G S K P K A M C K I N P T L C * F
H E D I I S L W D Q S L K P C V K L T P L C V S L
TGCATGAGGATATAATCAGTTTATGGGATCAAAGCCTAAAGCCATGTCTAAAATTAACCCCACTCTGTGTTAGTTT
6010 6020 6030 6040 6050 6060 6070
I P I V V A G K * * W R K E R * K T A L S I S A Q
Y Q * * * R G N D D G E R R D K K L L F Q Y Q H K
T N S S S G E M M M E K G E I K N C S F N I S T S
ATACCAATAGTAGTAGCGGGGAAATGATGATGGAGAAAGGAGAGATAAAAAACTGCTCTTTCAATATCAGCACAAG
6130 6140 6150 6160 6170 6180 6190
L I * Y Q * I M I L P A I R * Q V V T P Q S L H R
* Y N T N R * * Y Y Q L Y V D K L * H L S H Y T G
D I I P I D N D T T S Y T L T S C N T S V I T Q A
TTGATATAATACCAATAGATAATGATACTACCAGCTATACGTTCACAAGTTGTAACACCTCAGTCATTACACAGGG
6250 6260 6270 6280 6290 6300 6310
P R L V L R P * N V I I R R S M E Q D H V Q M S A

FIG. 13

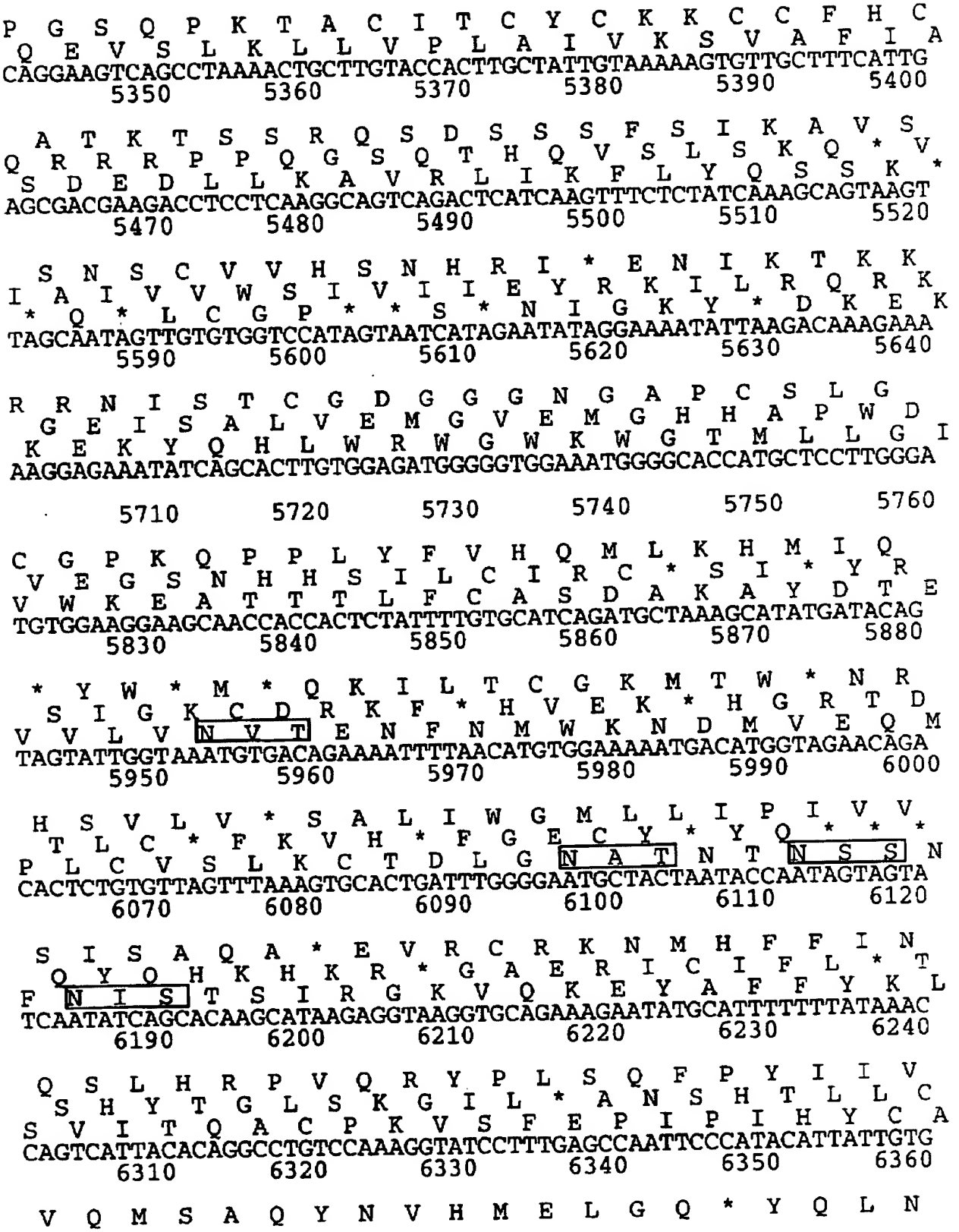

P G S Q P K T A C I T C Y C K K C C F H C
Q E V S L K L L V P L A I V K S V A F I A
CAGGAAGTCAGCCTAAAACTGCTTGTACCACTTGCTATTGTAAAAAGTGTTGCTTTCATTG
5350 5360 5370 5380 5390 5400
A T K T S S R Q S D S S S F S I K A V S
Q R R R P P Q G S Q T H Q V S L S K Q * V
S D E D L L K A V R L I K F L Y Q S S K *
AGCGACGAAGACCTCCTCAAGGCAGTCAGACTCATCAAGTTTCTCTATCAAAGCAGTAAGT
5470 5480 5490 5500 5510 5520
S N S C V V H S N H R I * E N I K T K K
I A I V V W S I V I I E Y R K I L R Q R K
* Q * L C G P * * S * N I G K Y * D K E K
TAGCAATAGTTGTGTGGTCCATAGTAATCATAGAATATAGGAAAATATTAAGACAAAGAAA
5590 5600 5610 5620 5630 5640
R R N I S T C G D G G G N G A P C S L G
G E I S A L V E M G V E M G H H A P W D
K E K Y Q H L W R W G W K W G T M L L G I
AAGGAGAAATATCAGCACTTGTGGAGATGGGGGTGGAAATGGGGCACCATGCTCCTTGGGA
5710 5720 5730 5740 5750 5760
C G P K Q P P L Y F V H Q M L K H M I Q
V E G S N H H S I L C I R C * S I * Y R
V W K E A T T T L F C A S D A K A Y D T E
TGTGGAAGGAAGCAACCACCACTCTATTTTGTGCATCAGATGCTAAAGCATATGATACAG
5830 5840 5850 5860 5870 5880
* Y W * M * Q K I L T C G K M T W * N R
S I G K C D R K F * H V E K * H G R T D
V V L V N V T E N F N M W K N D M V E Q M
TAGTATTGGTAAATGTGACAGAAAATTTTAACATGTGGAAAAATGACATGGTAGAACAGA
5950 5960 5970 5980 5990 6000
H S V L V * S A L I W G M L L I P I V V
T L C * F K V H * F G E C Y * Y Q * * *
P L C V S L K C T D L G N A T N T N S S N
CACTCTGTGTTAGTTTAAAGTGCACTGATTTGGGGAATGCTACTAATACCAATAGTAGTA
6070 6080 6090 6100 6110 6120
S I S A Q A * E V R C R K N M H F F I N
Q Y Q H K H K R * G A E R I C I F L * T
F N I S T S I R G K V Q K E Y A F F Y K L
TCAATATCAGCACAAGCATAAGAGGTAAGGTGCAGAAAGAATATGCATTTTTTTATAAAC
6190 6200 6210 6220 6230 6240
Q S L H R P V Q R Y P L S Q F P Y I I V
S H Y T G L S K G I L * A N S H T L L C
S V I T Q A C P K V S F E P I P I H Y C A
CAGTCATTACACAGGCCTGTCCAAAGGTATCCTTTGAGCCAATTCCCATACATTATTGTG
6310 6320 6330 6340 6350 6360
V Q M S A Q Y N V H M E L G Q * Y Q L N

FIG. 14

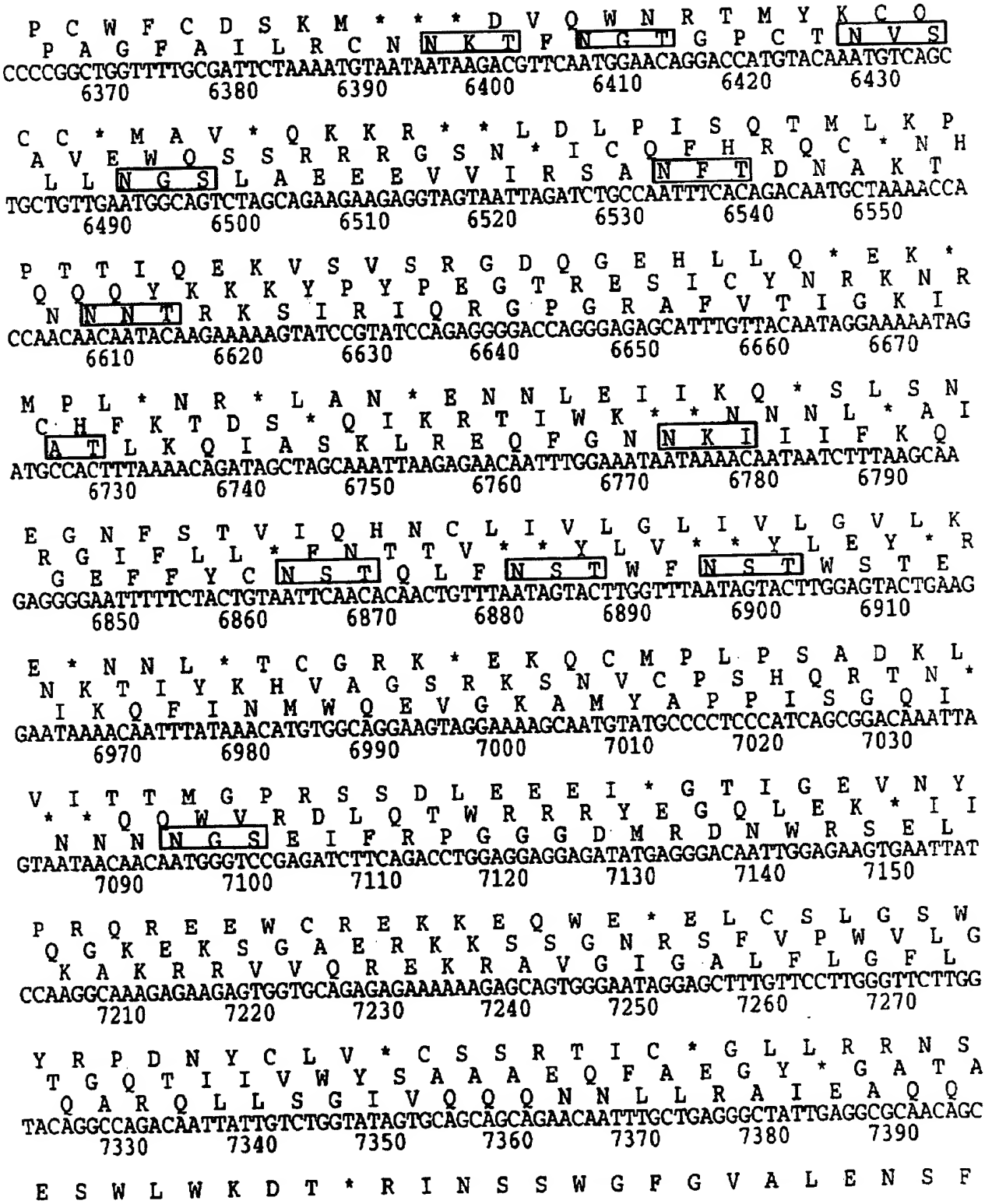

P C W F C D S K M * * * D V Q W N R T M Y K C Q
P A G F A I L R C N N K T F N G T G P C T N V S
CCCCGGCTGGTTTTGCGATTCTAAAATGTAATAATAAGACGTTCAATGGAACAGGACCATGTACAAATGTCAGC
6370 6380 6390 6400 6410 6420 6430
C C * M A V * Q K K R * * L D L P I S Q T M L K P
A V E W Q S S R R R G S N * I C Q F H R Q C * N H
L L N G S L A E E E V V I R S A N F T D N A K T
TGCTGTTGAATGGCAGTCTAGCAGAAGAAGAGGTAGTAATTAGATCTGCCAATTTCACAGACAATGCTAAAACCA
6490 6500 6510 6520 6530 6540 6550
P T T I Q E K V S V S R G D Q G E H L L Q * E K *
Q Q Q Y K K K Y P Y P E G T R E S I C Y N R K N R
N N N T R K S I R I Q R G P G R A F V T I G K I
CCAACAACAATACAAGAAAAAGTATCCGTATCCAGAGGGGACCAGGGAGAGCATTTGTTACAATAGGAAAAATAG
6610 6620 6630 6640 6650 6660 6670
M P L * N R * L A N * E N N L E I I K Q * S L S N
C H F K T D S * Q I K R T I W K * * N N N L * A I
A T L K Q I A S K L R E Q F G N N K I I I F K Q
ATGCCACTTTAAAACAGATAGCTAGCAAATTAAGAGAACAATTTGGAAATAATAAAACAATAATCTTTAAGCAA
6730 6740 6750 6760 6770 6780 6790
E G N F S T V I Q H N C L I V L G L I V L G V L K
R G I F L L * F N T T V * * Y L V * * Y L E Y * R
G E F F Y C N S T Q L F N S T W F N S T W S T E
GAGGGGAATTTTTCTACTGTAATTCAACACAACTGTTTAATAGTACTTGGTTTAATAGTACTTGGAGTACTGAAG
6850 6860 6870 6880 6890 6900 6910
E * N N L * T C G R K * E K Q C M P L P S A D K L
N K T I Y K H V A G S R K S N V C P S H Q R T N *
I K Q F I N M W Q E V G K A M Y A P P I S G Q I
GAATAAAACAATTTATAAACATGTGGCAGGAAGTAGGAAAAGCAATGTATGCCCCTCCCATCAGCGGACAAATTA
6970 6980 6990 7000 7010 7020 7030
V I T T M G P R S S D L E E E I * G T I G E V N Y
* * Q Q W V R D L Q T W R R R Y E G Q L E K * I I
N N N N G S E I F R P G G G D M R D N W R S E L
GTAATAACAACAATGGGTCCGAGATCTTCAGACCTGGAGGAGGAGATATGAGGGACAATTGGAGAAGTGAATTAT
7090 7100 7110 7120 7130 7140 7150
P R Q R E E W C R E K K E Q W E * E L C S L G S W
Q G K E K S G A E R K K S S G N R S F V P W V L G
K A K R R V V Q R E K R A V G I G A L F L G F L
CCAAGGCAAAGAGAAGAGTGGTGCAGAGAGAAAAAAGAGCAGTGGGAATAGGAGCTTTGTTCCTTGGGTTCTTGG
7210 7220 7230 7240 7250 7260 7270
Y R P D N Y C L V * C S S R T I C * G L L R R N S
T G Q T I I V W Y S A A A E Q F A E G Y * G A T A
Q A R Q L L S G I V Q Q Q N N L L R A I E A Q Q
TACAGGCCAGACAATTATTGTCTGGTATAGTGCAGCAGCAGAACAATTTGCTGAGGGCTATTGAGGCGCAACAGC
7330 7340 7350 7360 7370 7380 7390
E S W L W K D T * R I N S S W G F G V A L E N S F

FIG.15

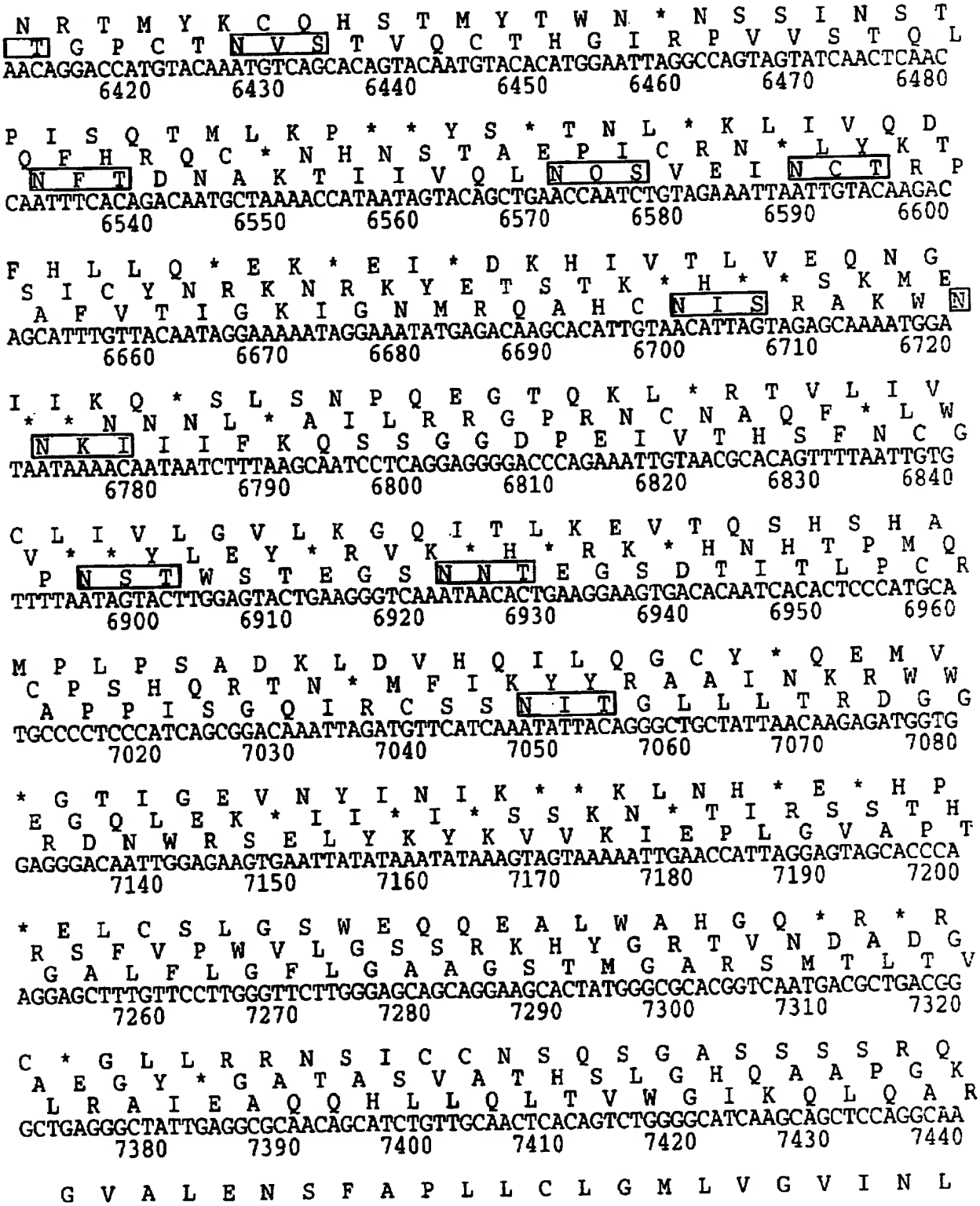
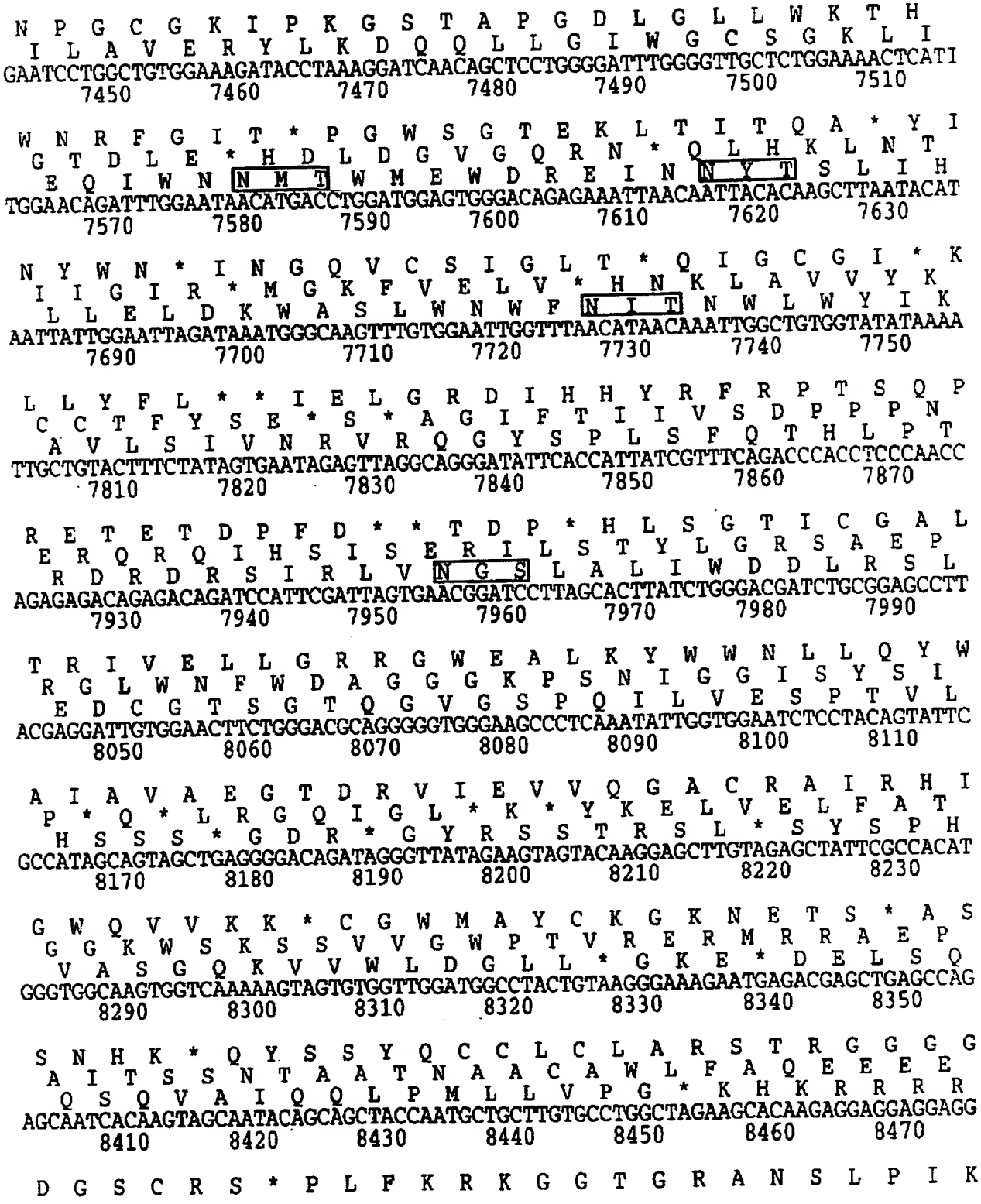

N R T M Y K C Q H S T M Y T W N * N S S I N S T
T G P C T N V S T V Q C T H G I R P V V S T Q L
AACAGGACCATGTACAAATGTCAGCACAGTACAATGTACACATGGAATTAGGCCAGTAGTATCAACTCAAC
6420 6430 6440 6450 6460 6470 6480
P I S Q T M L K P * * Y S * T N L * K L I V Q D
Q F H R Q C * N H N S T A E P I C R N * L Y K T
N F T D N A K T I I V Q L N Q S V E I N C T R P
CAATTTCACAGACAATGCTAAAACCATAATAGTACAGCTGAACCAATCTGTAGAAATTAATTGTACAAGAC
6540 6550 6560 6570 6580 6590 6600
F H L L Q * E K * E I * D K H I V T L V E Q N G
S I C Y N R K N R K Y E T S T K * H * * S K M E
A F V T I G K I G N M R Q A H C N I S R A K W N
AGCATTTGTTACAATAGGAAAAATAGGAAATATGAGACAAGCACATTGTAACATTAGTAGAGCAAAATGGA
6660 6670 6680 6690 6700 6710 6720
I I K Q * S L S N P Q E G T Q K L * R T V L I V
* * N N N L * A I L R R G P R N C N A Q F * L W
N K I I I F K Q S S G G D P E I V T H S F N C G
TAATAAAACAATAATCTTTAAGCAATCCTCAGGAGGGGACCCAGAAATTGTAACGCACAGTTTTAATTGTG
6780 6790 6800 6810 6820 6830 6840
C L I V L G V L K G Q I T L K E V T Q S H S H A
V * * Y L E Y * R V K * H * R K * H N H T P M Q
P N S T W S T E G S N N T E G S D T I T L P C R
TTTTAATAGTACTTGGAGTACTGAAGGGTCAAATAACACTGAAGGAAGTGACACAATCACACTCCCATGCA
6900 6910 6920 6930 6940 6950 6960
M P L P S A D K L D V H Q I L Q G C Y * Q E M V
C P S H Q R T N * M F I K Y Y R A A I N K R W W
A P P I S G Q I R C S S N I T G L L L T R D G G
TGCCCCTCCCATCAGCGGACAAATTAGATGTTCATCAAATATTACAGGGCTGCTATTAACAAGAGATGGTG
7020 7030 7040 7050 7060 7070 7080
* G T I G E V N Y I N I K * * K L N H * E * H P
E G Q L E K * I I * I * S S K N * T I R S S T H
R D N W R S E L Y K Y K V V K I E P L G V A P T
GAGGGACAATTGGAGAAGTGAATTATATAAATATAAAGTAGTAAAAATTGAACCATTAGGAGTAGCACCCA
7140 7150 7160 7170 7180 7190 7200
* E L C S L G S W E Q Q E A L W A H G Q * R * R
R S F V P W V L G S S R K H Y G R T V N D A D G
G A L F L G F L G A A G S T M G A R S M T L T V
AGGAGCTTTGTTCCTTGGGTTCTTGGGAGCAGCAGGAAGCACTATGGGCGCACGGTCAATGACGCTGACGG
7260 7270 7280 7290 7300 7310 7320
C * G L L R R N S I C C N S Q S G A S S S S R Q
A E G Y * G A T A S V A T H S L G H Q A A P G K
L R A I E A Q Q H L L Q L T V W G I K Q L Q A R
GCTGAGGGCTATTGAGGCGCAACAGCATCTGTTGCAACTCACAGTCTGGGGCATCAAGCAGCTCCAGGCAA
7380 7390 7400 7410 7420 7430 7440
G V A L E N S F A P L L C L G M L V G V I N L

FIG. 16


N P G C G K I P K G S T A P G D L G L L W K T H
I L A V E R Y L K D Q Q L L G I W G C S G K L I
GAATCCTGGCTGTGGAAAGATACCTAAAGGATCAACAGCTCCTGGGGATTTGGGGTTGCTCTGGAAAACTCATI
7450 7460 7470 7480 7490 7500 7510
W N R F G I T * P G W S G T E K L T I T Q A * Y I
G T D L E * H D L D G V G Q R N * Q L H K L N T
E Q I W N N M T W M E W D R E I N N Y T S L I H
TGGAACAGATTTGGAATAACATGACCTGGATGGAGTGGGACAGAGAAATTAACAATTACACAAGCTTAATACAT
7570 7580 7590 7600 7610 7620 7630
N Y W N * I N G Q V C S I G L T * Q I G C G I * K
I I G I R * M G K F V E L V * H N K L A V V Y K
L L E L D K W A S L W N W F N I T N W L W Y I K
AATTATTGGAATTAGATAAATGGGCAAGTTTGTGGAATTGGTTTAACATAACAAATTGGCTGTGGTATATAAAA
7690 7700 7710 7720 7730 7740 7750
L L Y F L * * I E L G R D I H H Y R F R P T S Q P
C C T F Y S E * S * A G I F T I I V S D P P P N
A V L S I V N R V R Q G Y S P L S F Q T H L P T
TTGCTGTACTTTCTATAGTGAATAGAGTTAGGCAGGGATATTCACCATTATCGTTTCAGACCCACCTCCCAACC
7810 7820 7830 7840 7850 7860 7870
R E T E T D P F D * * T D P * H L S G T I C G A L
E R Q R Q I H S I S E R I L S T Y L G R S A E P
R D R D R S I R L V N G S L A L I W D D L R S L
AGAGAGACAGAGACAGATCCATTCGATTAGTGAACGGATCCTTAGCACTTATCTGGGACGATCTGCGGAGCCTT
7930 7940 7950 7960 7970 7980 7990
T R I V E L L G R R G W E A L K Y W W N L L Q Y W
R G L W N F W D A G G G K P S N I G G I S Y S I
E D C G T S G T Q G V G S P Q I L V E S P T V L
ACGAGGATTGTGGAACTTCTGGGACGCAGGGGGTGGGAAGCCCTCAAATATTGGTGGAATCTCCTACAGTATTC
8050 8060 8070 8080 8090 8100 8110
A I A V A E G T D R V I E V V Q G A C R A I R H I
P * Q * L R G Q I G L * K * Y K E L V E L F A T
H S S S * G D R * G Y R S S T R S L * S Y S P H
GCCATAGCAGTAGCTGAGGGGACAGATAGGGTTATAGAAGTAGTACAAGGAGCTTGTAGAGCTATTCGCCACAT
8170 8180 8190 8200 8210 8220 8230
G W Q V V K K * C G W M A Y C K G K N E T S * A S
G G K W S K S S V V G W P T V R E R M R R A E P
V A S G Q K V V W L D G L L * G K E * D E L S Q
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8290 8300 8310 8320 8330 8340 8350
S N H K * Q Y S S Y Q C C L C L A R S T R G G G G
A I T S S N T A A T N A A C A W L F A Q E E E E
Q S Q V A I Q Q L P M L L V P G * K H K R R R R
AGCAATCACAAGTAGCAATACAGCAGCTACCAATGCTGCTTGTGCCTGGCTAGAAGCACAAGAGGAGGAGGAGG
8410 8420 8430 8440 8450 8460 8470
D G S C R S * P L F K R K G G T G R A N S L P I K

FIG. 17

```
  W  K  T  H  L  H  H  C  C  A  L  E  C  *  L  E  *  *  I  S
    G  K  L  I  C  T  T  A  V  P  W  N  A  S  W  S  N  K  S  L
CTGGAAAACTCATTTGCACCACTGCTGTGCCTTGGAATGCTAGTTGGAGTAATAAATCTC
      7510       7520       7530       7540       7550       7560

  Q  A  *  Y  I  P  *  L  K  N  R  K  T  S  K  K  R  M  N  K
    K  L  N  T  F  L  N  *  R  I  A  K  P  A  R  K  E  *  T  R
      S  L  I  H  S  L  I  E  E  S  Q  N  Q  Q  E  K  N  E  Q  E
CAAGCTTAATACATTCCTTAATTGAAGAATCGCAAAACCAGCAAGAAAAGAATGAACAAG
      7630       7640       7650       7660       7670       7680

  C  G  I  *  K  Y  S  *  *  *  *  E  A  W  *  V  *  E  *  F
    V  V  Y  K  N  I  H  N  D  S  R  R  L  G  R  F  K  N  S  F
      W  Y  I  K  I  F  I  M  I  V  G  G  L  V  G  L  R  I  V  F
TGTGGTATATAAAAATATTCATAATGATAGTAGGAGGCTTGGTAGGTTTAAGAATAGTTT
      7750       7760       7770       7780       7790       7800

  P  T  S  Q  P  R  G  D  P  T  G  P  K  E  *  K  K  K  V  E
    P  P  P  N  P  E  G  T  R  Q  A  R  R  N  R  R  R  R  W  R
      H  L  P  T  P  R  G  P  D  R  P  E  G  I  E  E  E  G  G  E
CCACCTCCCAACCCCGAGGGGACCCGACAGGCCCGAAGGAATAGAAGAAGAAGGTGGAG
      7870       7880       7890       7900       7910       7920

  I  C  G  A  L  C  L  F  S  Y  H  R  L  R  D  L  L  L  I  V
    S  A  E  P  C  A  S  S  A  T  T  A  *  E  T  Y  S  *  L  *
      L  R  S  L  V  P  L  Q  L  P  P  L  E  R  L  T  L  D  C  N
TCTGCGGAGCCTTGTGCCTCTTCAGCTACCACCGCTTGAGAGACTTACTCTTGATTGTA
      7990       8000       8010       8020       8030       8040

  L  L  Q  Y  W  S  Q  E  L  K  N  S  A  V  S  L  L  N  A  T
    S  Y  S  I  G  V  R  N  *  R  I  V  L  L  A  C  S  M  P  Q
      P  T  V  L  E  S  G  T  K  E  *  C  C  *  L  A  Q  C  H  S
TCCTACAGTATTGGAGTCAGGAACTAAAGAATAGTGCTGTTAGCTTGCTCAATGCCACA
      8110       8120       8130       8140       8150       8160

  A  I  R  H  I  P  R  R  I  R  Q  G  L  E  R  I  L  L  *  D
    L  F  A  T  Y  L  E  E  *  D  R  A  W  K  G  F  C  Y  K  M
      Y  S  P  H  T  *  K  N  K  T  G  L  G  K  D  F  A  I  R  W
CTATTCGCCACATACCTAGAAGAATAAGACAGGGCTTGGAAAGGATTTTGCTATAAGAT
      8230       8240       8250       8260       8270       8280

  T  S  *  A  S  S  R  W  G  G  S  S  I  S  R  P  G  K  T  W
    R  A  E  P  A  A  D  G  V  G  A  A  S  R  D  L  E  K  H  G
      E  L  S  Q  Q  Q  M  G  W  E  Q  H  L  E  T  W  K  N  M  E
CGAGCTGAGCCAGCAGCAGATGGGGTGGGAGCAGCATCTCGAGACCTGGAAAAACATGG
      8350       8360       8370       8380       8390       8400

  Q  G  G  G  G  G  G  F  S  S  H  T  S  G  T  F  K  T  N  D  L
    E  E  E  E  V  G  F  P  V  T  P  Q  V  P  L  R  P  M  T  Y
      R  R  R  R  W  V  F  Q  S  H  L  R  Y  L  *  D  Q  *  L  T
GAGGAGGAGGAGGTGGGTTTCCAGTCACACCTCAGGTACCTTTAAGACCAATGACTTA
      8470       8480       8490       8500       8510       8520

    L  P  T  K  T  R  Y  P  *  S  V  D  L  P  H  T  R  L  L
```

FIG. 18

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        10          20          30          40          50          60
AAGCTTGCCT TGAGTGCTTC AAGTAGTGTG TGCCCGTCTG TTGTGTGACT CTGGTAACTA
        70          80          90         100         110         120
GAGATCCCTC AGACCCTTTT AGTCAGTGTG GAAAATCTCT AGCAGTGGCG CCCGAACAGG
       130         140         150         160         170         180
GACTTGAAAG CGAAAGGGAA ACCAGAGGAG CTCTCTCGAC GCAGGACTCG GCTTGCTGAA
       190         200         210         220         230         240
GCGCGCACGG CAAGAGGCGA GGGGAGGCGA CTGGTGAGTA CGCCAAAAAT TTTGACTAGC
       250         260         270         280         290         300
GGAGGCTAGA AGGAGAGAGA TGGGTGCGAG AGCGTCAGTA TTAAGCGGGG GAGAATTAGA
       310         320         330         340         350         360
TCGATCGGAA AAAATTCGGT TAAGGCCAGG GGCAAAGAAA AAATATAAAT TAAAACATAT
       370         380         390         400         410         420
AGTATGGGCA AGCAGGGAGC TAGAACGATT CGCTGTTAAT CCTGGCCTGT TAGAAACATC
       430         440         450         460         470         480
AGAAGGCTGT AGACAAATAC TGGGACAGCT ACAACCATCC CTTCAGACAG GATCAGAAGA
       490         500         510         520         530         540
ACTTAGATCA TTATATAATA CAGTAGCAAC CCTCTATTGT GTGCATCAAA GGATAGAGAT
       550         560         570         580         590         600
AAAAGACACC AAGGAAGCTT TAGACAAGAT AGAGGAAGAG CAAAACAAAA GTAAGAAAAA
       610         620         630         640         650         660
AGCACAGCAA GCAGCAGCTG ACACAGGACA CAGCAGCCAG GTCAGCCAAA ATTACCCTAT
       670         680         690         700         710         720
AGTGCAGAAC ATCCAGGGGC AAATGGTACA TCAGGCCATA TCACCTAGAA CTTTAAATGC
       730         740         750         760         770         780
ATGGGTAAAA GTAGTAGAAG AGAAGGCTTT CAGCCCAGAA GTGATACCCA TGTTTTCAGC
       790         800         810         820         830         840
ATTATCAGAA GGAGCCACCC CACAAGATTT AAACACCATG CTAAACACAG TGGGGGGACA
       850         860         870         880         890         900
TCAAGCAGCC ATGCAAATGT TAAAAGAGAC CATCAATGAG GAAGCTGCAG AATGGGATAG
       910         920         930         940         950         960
AGTGCATCCA GTGCATGCAG GGCCTATTGC ACCAGGCCAG ATGAGAGAAC CAAGGGGAAG
       970         980         990        1000        1010        1020
TGACATAGCA GGAACTACTA GTACCCTTCA GGAACAAATA GGATGGATGA CAAATAATCC
      1030        1040        1050        1060        1070        1080
ACCTATCCCA GTAGGAGAAA TTTATAAAAG ATGGATAATC CTGGGATTAA ATAAAATAGT
      1090        1100        1110        1120        1130        1140
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FIG. 19

AAGAATGTAT AGCCCTACCA GCATTCTGGA CATAAGACAA GGACCAAAAG AACCCTTTAG
1150 1160 1170 1180 1190 1200
AGACTATGTA GACCGGTTCT ATAAAACTCT AAGAGCCGAG CAAGCTTCAC AGGAGGTAAA
1210 1220 1230 1240 1250 1260
AAATTGGATG ACAGAAACCT TGTTGGTCCA AAATGCGAAC CCAGATTGTA AGACTATTTT
1270 1280 1290 1300 1310 1320
AAAAGCATTG GGACCAGCAG CTACACTAGA AGAAATGATG ACAGCATGTC AGGGAGTGGG
1330 1340 1350 1360 1370 1380
AGGACCCGGC CATAAGGCAA GAGTTTTGGC TGAAGCAATG AGCCAAGTAA CAAATTCAGC
1390 1400 1410 1420 1430 1440
TACCATAATG ATGCAAAGAG GCAATTTTAG GAACCAAAGA AAGATTGTTA AGTGTTTCAA
1450 1460 1470 1480 1490 1500
TTGTGGCAAA GAAGGGCACA TAGCCAGAAA TTGCAGGGCC CCTAGGAAAA AGGGCTGTTG
1510 1520 1530 1540 1550 1560
GAAATGTGGA AAGGAAGGAC ACCAAATGAA AGATTGTACT GAGAGACAGG CTAATTTTTT
1570 1580 1590 1600 1610 1620
AGGGAAGATC TGGCCTTCCT ACAAGGGAAG GCCAGGGAAT TTTCTTCAGA GCAGACCAGA
1630 1640 1650 1660 1670 1680
GCCAACAGCC CCACCAGAAG AGAGCTTCAG GTCTGGGGTA GAGACAACAA CTCCCTCTCA
1690 1700 1710 1720 1730 1740
GAAGCAGGAG CCGATAGACA AGGAACTGTA TCCTTTAACT TCCCTCAGAT CACTCTTTGG
1750 1760 1770 1780 1790 1800
CAACGACCCC TCGTCACAAT AAAGATAGGG GGGCAACTAA AGGAAGCTCT ATTAGATACA
1810 1820 1830 1840 1850 1860
GGAGCAGATG ATACAGTATT AGAAGAAATG AGTTTGCCAG GAAGATGGAA ACCAAAAATG
1870 1880 1890 1900 1910 1920
ATAGGGGGAA TTGGAGGTTT TATCAAAGTA AGACAGTATG ATCAGATACT CATAGAAATC
1930 1940 1950 1960 1970 1980
TGTGGACATA AAGCTATAGG TACAGTATTA GTAGGACCTA CACCTGTCAA CATAATTGGA
1990 2000 2010 2020 2030 2040
AGAAATCTGT TGACTCAGAT TGGTTGCACT TTAAATTTTC CCATTAGTCC TATTGAAACT
2050 2060 2070 2080 2090 2100
GTACCAGTAA AATTAAAGCC AGGAATGGAT GGCCCAAAAG TTAAACAATG GCCATTGACA
2110 2120 2130 2140 2150 2160
GAAGAAAAAA TAAAAGCATT AGTAGAAATT TGTACAGAAA TGGAAAAGGA AGGGAAAATT
2170 2180 2190 2200 2210 2220
TCAAAAATTG GGCCTGAAAA TCCATACAAT ACTCCAGTAT TTGCCATAAA GAAAAAAGAC
2230 2240 2250 2260 2270 2280
AGTACTAAAT GGAGAAAATT AGTAGATTTC AGAGAACTTA ATAAGAGAAC TCAAGACTTC
2290 2300 2310 2320 2330 2340
TGGGAAGTTC AATTAGGAAT ACCACATCCC GCAGGGTTAA AAAAGAAAAA ATCAGTAACA
2350 2360 2370 2380 2390 2400

FIG. 20

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GTACTGGATG TGGGTGATGC ATATTTTTCA GTTCCCTTAG ATGAAGACTT CAGGAAGTAT
      2410        2420        2430        2440        2450        2460
ACTGCATTTA CCATACCTAG TATAAACAAT GAGACACCAG GGATTAGATA TCAGTACAAT
      2470        2480        2490        2500        2510        2520
GTGCTTCCAC AGGGATGGAA AGGATCACCA GCAATATTCC AAAGTAGCAT GACAAAAATC
      2530        2540        2550        2560        2570        2580
TTAGAGCCTT TTAGAAAACA AAATCCAGAC ATAGTTATCT ATCAATACAT GGATGATTTG
      2590        2600        2610        2620        2630        2640
TATGTAGGAT CTGACTTAGA AATAGGGCAG CATAGAACAA AAATAGAGGA GCTGAGACAA
      2650        2660        2670        2680        2690        2700
CATCTGTTGA GGTGGGGACT TACCACACCA GACAAAAAAC ATCAGAAAGA ACCTCCATTC
      2710        2720        2730        2740        2750        2760
CTTTGGATGG GTTATGAACT CCATCCTGAT AAATGGACAG TACAGCCTAT AGTGCTGCCA
      2770        2780        2790        2800        2810        2820
GAAAAAGACA GCTGGACTGT CAATGACATA CAGAAGTTAG TGGGAAAATT GAATTGGGCA
      2830        2840        2850        2860        2870        2880
AGTCAGATTT ACCCAGGGAT TAAAGTAAGG CAATTATGTA AACTCCTTAG AGGAACCAAA
      2890        2900        2910        2920        2930        2940
GCACTAACAG AAGTAATACC ACTAACAGAA GAAGCAGAGC TAGAACTGGC AGAAAACAGA
      2950        2960        2970        2980        2990        3000
GAGATTCTAA AAGAACCAGT ACATGGAGTG TATTATGACC CATCAAAAGA CTTAATAGCA
      3010        3020        3030        3040        3050        3060
GAAATACAGA AGCAGGGGCA AGGCCAATGG ACATATCAAA TTTATCAAGA GCCATTTAAA
      3070        3080        3090        3100        3110        3120
AATCTGAAAA CAGGAAAATA TGCAAGAACG AGGGGTGCCC ACACTAATGA TGTAAAACAA
      3130        3140        3150        3160        3170        3180
TTAACAGAGG CAGTGCAAAA AATAACCACA GAAAGCATAG TAATATGGGG AAAGACTCCT
      3190        3200        3210        3220        3230        3240
AAATTTAAAC TACCCATACA AAAGGAAACA TGGGAAACAT GGTGGACAGA GTATTGGCAA
      3250        3260        3270        3280        3290        3300
GCCACCTGGA TTCCTGAGTG GGAGTTTGTC AATACCCCTC CTTTAGTGAA ATTATGGTAC
      3310        3320        3330        3340        3350        3360
CAGTTAGAGA AAGAACCCAT AGTAGGAGCA GAAACGTTCT ATGTAGATGG GGCAGCTAGC
      3370        3380        3390        3400        3410        3420
AGGGAGACTA AATTAGGAAA AGCAGGATAT GTTACTAATA GAGGAAGACA AAAAGTTGTC
      3430        3440        3450        3460        3470        3480
ACCCTAACTG ACACAACAAA TCAGAAGACT GAGTTACAAG CAATTCATCT AGCTTTGCAG
      3490        3500        3510        3520        3530        3540
GATTCGGGAT TAGAAGTAAA TATAGTAACA GACTCACAAT ATGCATTAGG AATCATTCAA
      3550        3560        3570        3580        3590        3600
GCACAACCAG ATAAAAGTGA ATCAGAGTTA GTCAATCAAA TAATAGAGCA GTTAATAAAA
      3610        3620        3630        3640        3650        3660
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FIG. 21

AAGCAAAAGG TCTATCTGGC ATGGGTACCA GCACACAAAG GAATTGGAGG AAATGAACAA
3670 3680 3690 3700 3710 3720
GTAGATAAAT TAGTCAGTGC TGGAATCAGG AAAGTACTAT TTTTAGATGG AATAGATAAG
3730 3740 3750 3760 3770 3780
GCCCAAGATG AACATGAGAA ATATCACAGT AATTGGAGAG CAATGGCTAG TGATTTTAAC
3790 3800 3810 3820 3830 3840
CTGCCACCTG TAGTAGCAAA AGAAATAGTA GCCAGCTGTG ATAAATGTCA GCTAAAAGGA
3850 3860 3870 3880 3890 3900
GAAGCCATGC ATGGACAAGT AGACTGTAGT CCAGGAATAT GGCAACTAGA TTGTACACAT
3910 3920 3930 3940 3950 3960
TTAGAAGGAA AAGTTATCCT GGTAGCAGTT CATGTAGCCA GTGGATATAT AGAAGCAGAA
3970 3980 3990 4000 4010 4020
GTTATTCCAG CAGAAACAGG GCAGGAAACA GCATACTTTC TTTTAAAATT AGCAGGAAGA
4030 4040 4050 4060 4070 4080
TGGCCAGTAA AAACAATACA TACAGACAAT GGCAGCAATT TCACCAGTAC TACGGTTAAG
4090 4100 4110 4120 4130 4140
GCCGCCTGTT GGTGGGCGGG AATCAAGCAG GAATTTGGAA TTCCCTACAA TCCCCAAAGT
4150 4160 4170 4180 4190 4200
CAAGGAGTAG TAGAATCTAT GAATAAAGAA TTAAAGAAAA TTATAGGCCA GGTAAGAGAT
4210 4220 4230 4240 4250 4260
CAGGCTGAAC ATCTTAAGAC AGCAGTACAA ATGGCAGTAT TCATCCACAA TTTTAAAAGA
4270 4280 4290 4300 4310 4320
AAAGGGGGGA TTGGGGGGTA CAGTGCAGGG GAAAGAATAG TAGACATAAT AGCAACAGAC
4330 4340 4350 4360 4370 4380
ATACAAACTA AAGAATTACA AAAACAAATT ACAAAAATTC AAAATTTTCG GGTTTATTAC
4390 4400 4410 4420 4430 4440
AGGGACAGCA GAGATCCACT TTGGAAAGGA CCAGCAAAGC TCCTCTGGAA AGGTGAAGGG
4450 4460 4470 4480 4490 4500
GCAGTAGTAA TACAAGATAA TAGTGACATA AAAGTAGTGC CAAGAAGAAA AGCAAAGATC
4510 4520 4530 4540 4550 4560
ATTAGGGATT ATGGAAAACA GATGGCAGGT GATGATTGTG TGGCAAGTAG ACAGGATGAG
4570 4580 4590 4600 4610 4620
GATTAGAACA TGGAAAAGTT TAGTAAAACA CCATATGTAT GTTTCAGGGA AAGCTAGGGG
4630 4640 4650 4660 4670 4680
ATGGTTTTAT AGACATCACT ATGAAAGCCC TCATCCAAGA ATAAGTTCAG AAGTACACAT
4690 4700 4710 4720 4730 4740
CCCACTAGGG GATGCTAGAT TGGTAATAAC AACATATTGG GGTCTGCATA CAGGAGAAAG
4750 4760 4770 4780 4790 4800
AGACTGGCAT CTGGGTCAGG GAGTCTCCAT AGAATGGAGG AAAAAGAGAT ATAGCACACA
4810 4820 4830 4840 4850 4860
AGTAGACCCT GAACTAGCAG ACCAACTAAT TCATCTGTAT TACTTTGACT GTTTTTCAGA
4870 4880 4890 4900 4910 4920

FIG. 22

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CTCTGCTATA AGAAAGGCCT TATTAGGACA TATAGTTAGC CCTAGGTGTG AATATCAAGC
      4930        4940        4950        4960        2970        2980
AGGACATAAC AAGGTAGGAT CTCTACAATA CTTGGCACTA GCAGCATTAA TAACACCAAA
      4990        5000        5010        5020        5030        5040
AAAGATAAAG CCACCTTTGC CTAGTGTTAC GAAACTGACA GAGGATAGAT GGAACAAGCC
      5050        5060        5070        5080        5090        5100
CCAGAAGACC AAGGGCCACA GAGGGAGCCA CACAATGAAT GGACACTAGA GCTTTTAGAG
      5110        5120        5130        5140        5150        5160
GAGCTTAAGA ATGAAGCTGT TAGACATTTT CCTAGGATTT GGCTCCATGG CTTAGGGCAA
      5170        5180        5190        5200        5210        5220
CATATCTATG AAACTTATGG GGATACTTGG GCAGGAGTGG AAGCCATAAT AAGAATTCTG
      5230        5240        5250        5260        5270        5280
CAACAACTGC TGTTTATCCA TTTCAGAATT GGGTGTCGAC ATAGCAGAAT AGGCGTTACT
      5290        5300        5310        5320        5330        5340
CAACAGAGGA GAGCAAGAAA TGGAGCCAGT AGATCCTAGA CTAGAGCCCT GGAAGCATCC
      5350        5360        5370        5380        5390        5400
AGGAAGTCAG CCTAAAACTG CTTGTACCAC TTGCTATTGT AAAAAGTGTT GCTTTCATTG
      5410        5420        5430        5440        5450        5460
CCAAGTTTGT TTCACAACAA AAGCCTTAGG CATCTCCTAT GGCAGGAAGA AGCGGAGACA
      5470        5480        5490        5500        5510        5520
GCGACGAAGA CCTCCTCAAG GCAGTCAGAC TCATCAAGTT TCTCTATCAA AGCAGTAAGT
      5530        5540        5550        5560        5570        5580
AGTACATGTA ATGCAACCTA TACAAATAGC AATAGCAGCA TTAGTAGTAG CAATAATAAT
      5590        5600        5610        5620        5630        5640
AGCAATAGTT GTGTGGTCCA TAGTAATCAT AGAATATAGG AAAATATTAA GACAAAGAAA
      5650        5660        5670        5680        5690        5700
AATAGACAGG TTAATTGATA GACTAATAGA AAGAGCAGAA GACAGTGGCA ATGAGAGTGA
      5710        5720        5730        5740        5750        5760
AGGAGAAATA TCAGCACTTG TGGAGATGGG GGTGGAAATG GGGCACCATG CTCCTTGGGA
      5770        5780        5790        5800        5810        5820
TATTGATGAT CTGTAGTGCT ACAGAAAAAT TGTGGGTCAC AGTCTATTAT GGGGTACCTG
      5830        5840        5850        5860        5870        5880
TGTGGAAGGA AGCAACCACC ACTCTATTTT GTGCATCAGA TGCTAAAGCA TATGATACAG
      5890        5900        5910        5920        5930        5940
AGGTACATAA TGTTTGGGCC ACACATGCCT GTGTACCCAC AGACCCCAAC CCACAAGAAG
      5950        5960        5970        5980        5990        6000
TAGTATTGGT AAATGTGACA GAAAATTTTA ACATGTGGAA AAATGACATG GTAGAACAGA
      6010        6020        6030        6040        6050        6060
TGCATGAGGA TATAATCAGT TTATGGGATC AAAGCCTAAA GCCATGTGTA AAATTAACCC
      6070        6080        6090        6100        6110        6120
CACTCTGTGT TAGTTTAAAG TGCACTGATT TGGGGAATGC TACTAATACC AATAGTAGTA
      6130        6140        6150        6160        6170        6180
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FIG. 23

ATACCAATAG TAGTAGCGGG GAAATGATGA TGGAGAAAGG AGAGATAAAA AACTGCTCTT
6190 6200 6210 6220 6230 6240
TCAATATCAG CACAAGCATA AGAGGTAAGG TGCAGAAAGA ATATGCATTT TTTTATAAAC
6250 6260 6270 6280 6290 6300
TTGATATAAT ACCAATAGAT AATGATACTA CCAGCTATAC GTTGACAAGT TGTAACACCT
6310 6320 6330 6340 6350 6360
CAGTCATTAC ACAGGCCTGT CCAAAGGTAT CCTTTGAGCC AATTCCCATA CATTATTGTG
6370 6380 6390 6400 6410 6420
CCCCGGCTGG TTTTGCGATT CTAAAATGTA ATAATAAGAC GTTCAATGGA ACAGGACCAT
6430 6440 6450 6460 6470 6480
GTACAAATGT CAGCACAGTA CAATGTACAC ATGGAATTAG GCCAGTAGTA TCAACTCAAC
6490 6500 6510 6520 6530 6540
TGCTGTTGAA TGGCAGTCTA GCAGAAGAAG AGGTAGTAAT TAGATCTGCC AATTTCACAG
6550 6560 6570 6580 6590 6600
ACAATGCTAA AACCATAATA GTACAGCTGA ACCAATCTGT AGAAATTAAT TGTACAAGAC
6610 6620 6630 6640 6650 6660
CCAACAACAA TACAAGAAAA AGTATCCGTA TCCAGAGGGG ACCAGGGAGA GCATTTGTTA
6670 6680 6690 6700 6710 6720
CAATAGGAAA AATAGGAAAT ATGAGACAAG CACATTGTAA CATTAGTAGA GCAAAATGGA
6730 6740 6750 6760 6770 6780
ATGCCACTTT AAAACAGATA GCTAGCAAAT TAAGAGAACA ATTTGGAAAT AATAAAACAA
6790 6800 6810 6820 6830 6840
TAATCTTTAA GCAATCCTCA GGAGGGGACC CAGAAATTGT AACGCACAGT TTTAATTGTG
6850 6860 6870 6880 6890 6900
GAGGGGAATT TTTCTACTGT AATTCAACAC AACTGTTTAA TAGTACTTGG TTTAATAGTA
6910 6920 6930 6940 6950 6960
CTTGGAGTAC TGAAGGGTCA AATAACACTG AAGGAAGTGA CACAATCACA CTCCCATGCA
6970 6980 6990 7000 7010 7020
GAATAAAACA ATTTATAAAC ATGTGGCAGG AAGTAGGAAA AGCAATGTAT GCCCCTCCCA
7030 7040 7050 7060 7070 7080
TCAGCGGACA AATTAGATGT TCATCAAATA TTACAGGGCT GCTATTAACA AGAGATGGTG
7090 7100 7110 7120 7130 7140
GTAATAACAA CAATGGGTCC GAGATCTTCA GACCTGGAGG AGGAGATATG AGGGACAATT
7150 7160 7170 7180 7190 7200
GGAGAAGTGA ATTATATAAA TATAAAGTAG TAAAAATTGA ACCATTAGGA GTAGCACCCA
7210 7220 7230 7240 7250 7260
CCAAGGCAAA GAGAAGAGTG GTGCAGAGAG AAAAAAGAGC AGTGGGAATA GGAGCTTTGT
7270 7280 7290 7300 7310 7320
TCCTTGGGTT CTTGGGAGCA GCAGGAAGCA CTATGGGCGC ACGGTCAATG ACGCTGACGG
7390 7340 7350 7360 7370 7380
TACAGGCCAG ACAATTATTG TCTGGTATAG TGCAGCAGCA GAACAATTTG CTGAGGGCTA
7390 7400 7410 7420 7430 7440

FIG. 24

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TTGAGGCGCA ACAGCATCTG TTGCAACTCA CAGTCTGGGG CATCAAGCAG CTCCAGGCAA
      7450       7460       7470       7480       7490       7500
GAATCCTGGC TGTGGAAAGA TACCTAAAGG ATCAACAGCT CCTGGGGATT TGGGGTTGCT
      7510       7520       7530       7540       7550       7560
CTGGAAAACT CATTTGCACC ACTGCTGTGC CTTGGAATGC TAGTTGGAGT AATAAATCTC
      7570       7580       7590       7600       7610       7620
TGGAACAGAT TTGGAATAAC ATGACCTGGA TGGAGTGGGA CAGAGAAATT AACAATTACA
      7630       7640       7650       7660       7670       7680
CAAGCTTAAT ACATTCCTTA ATTGAAGAAT CGCAAAACCA GCAAGAAAAG AATGAACAAG
      7690       7700       7710       7720       7730       7740
AATTATTGGA ATTAGATAAA TGGGCAAGTT TGTGGAATTG GTTTAACATA ACAAATTGGC
      7750       7760       7770       7780       7790       7800
TGTGGTATAT AAAAATATTC ATAATGATAG TAGGAGGCTT GCTAGGTTTA AGAATAGTTT
      7810       7800       7810       7820       7830       7840
TTGCTGTACT TTCTATAGTG AATAGAGTTA GGCAGGGATA TTCACCATTA TCGTTTCAGA
      7870       7880       7890       7900       7910       7920
CCCACCTCCC AACCCCGAGG GGACCCGACA GGCCCGAAGG AATAGAAGAA GAAGGTGGAG
      7930       7940       7950       7960       7970       7980
AGAGAGACAG AGACAGATCC ATTCGATTAG TGAACGGATC CTTAGCACTT ATCTGGGACG
      7990       8000       8010       8020       8030       8040
ATCTGCGGAG CCTTGTGCCT CTTCAGCTAC CACCGCTTGA GAGACTTACT CTTGATTGTA
      8050       8060       8070       8080       8090       8100
ACGAGGATTG TGGAACTTCT GGGACGCAGG GGGTGGGAAG CCCTCAAATA TTGGTGGAAT
      8110       8120       8130       8140       8150       8160
CTCCTACAGT ATTGGAGTCA GGAACTAAAG AATAGTGCTG TTAGCTTGCT CAATGCCACA
      8170       8180       8190       8200       8210       8220
GCCATAGCAG TAGCTGAGGG GACAGATAGG GTTATAGAAG TAGTACAAGG AGCTTGTAGA
      8230       8240       8250       8260       8270       8280
GCTATTCGCC ACATACCTAG AAGAATAAGA CAGGGCTTGG AAAGGATTTT GCTATAAGAT
      8290       8300       8310       8320       8330       8340
GGGTGGCAAG TGGTCAAAAA GTAGTGTGGT TGGATGGCCT ACTGTAAGGG AAAGAATGAG
      8350       8360       8370       8380       8390       8400
ACGAGCTGAG CCAGCAGCAG ATGGGGTGGG AGCAGCATCT CGAGACCTGG AAAAACATGG
      8410       8420       8430       8440       8450       8460
AGCAATCACA AGTAGCAATA CAGCAGCTAC CAATGCTGCT TGTGCCTGGC TAGAAGCACA
      8470       8480       8490       8500       8510       8520
AGAGGAGGAG GAGGTGGGTT TTCCAGTCAC ACCTCAGGTA CCTTTAAGAC CAATGACTTA
      8530       8540       8550       8560       8570       8580
CAAGGCAGCT GTAGATCTTA GCCACTTTTT AAAAGAAAAG GGGGGACTGG AAGGGCTAAT
      8590       8600       8610       8620       8630       8640
TCACTCCCAA CGAAGACAAG ATATCCTTGA TCTGTGGATC TACCACACAC AAGGCTACTT
      8650       8660       8670       8680       8690       8700
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FIG. 25

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CCCTGATTGG CAGAACTACA CACCAGGGCC AGGGGTCAGA TATCCACTGA CCTTTGGATG
      8710       8720       8730       8740       8750       8760
GTGCTACAAG CTAGTACCAG TTGAGCCAGA TAAGGTAGAA GAGGCCAATA AAGGAGAGAA
      8770       8780       8790       8800       8810       8820
CACCAGCTTG TTACACCCTG TGAGCCTGCA TGGAATGGAT GACCCTGAGA GAGAAGTGTT
      8830       8840       8850       8860       8870       8880
AGAGTGGAGG TTTGACAGCC GCCTAGCATT TCATCACGTG GCCCGAGAGC TGCATCCGGA
      8890       8900       8910       8920       8930       8940
GTACTTCAAG AACTGCTGAC ATCGAGCTTG CTACAAGGGA CTTTCCGCTG GGGACTTTCC
      8950       8960       8970       8980       8990       9000
AGGGAGGCGT GGCCTGGGCG GAACTGGGGA GTGGCGAGCC CTCAGATGCT GCATATAAGC
      9010       9020       9030       9040       9050       9060
AGCTGCTTTT TGCCTGTACT GGGTCTCTCT GGTTAGACCA GATTTGAGCC TGGGAGCTCT
      9070       9080       9090       9100       9110       9120
CTGGCTAACT AGGGAACCCA CTGCTTAAGC CTCAATAAAG CTT
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FIG. 26